

DIVISION OF MEASUREMENT STANDARDS COMMITTEE MEETING
November 13, 2012

Purpose of Meeting: To conduct a workshop regarding a change to the NAC 590 Regulation to include a manganese labeling requirement. The requirement language would be:

Retailers who offer, or may offer, for sale gasoline which contains manganese or manganese containing compounds must affix a legible and conspicuous label to each gasoline dispenser which contains the following language:

This fuel contains or may contain manganese.

In Attendance:

Alfredo Alonso --- Auto Alliance, Auto Industry
Bill Striejewski --- Nevada Bureau of Petroleum Technology
Dave Jones --- Nevada Division of Measurement Standards
Gina Grey --- Western States Petroleum Association, Petroleum Industry
John Cabaniss --- Association of Global Automakers, Auto Industry
John Sande --- Western States Petroleum Association, Auto & Petroleum Industry
Lawrence Wah --- Nevada Petroleum Marketers Association (CSA), Petroleum Industry
Lea Tauchen --- Nevada Retail Association, Retail Industry
Michael Hillerby --- Honda, Auto Industry
Miles Heller --- British Petroleum, Petroleum Industry
Nick Economides --- Chevron Corp., Petroleum Industry
Paul Anderson --- Thomas Petroleum, Petroleum Industry and Board of Agriculture
Paul Richmond --- Western States Petroleum Association, Petroleum Industry
Peter Krueger --- Nevada Petroleum Marketers Association (CSA), Petroleum Industry
Randy Tackett --- Champion Chevrolet, Auto Industry

In General:

The Administrator of the Nevada Division of Measurement Standards conducted a workshop 9:00 – 11:15, November 13, 2012, to solicit comments, positions, feedback and impacts from the attendees and the public regarding manganese labeling. Comments and correspondence are attached for reference.

Each of the Attendees were asked to provide answers/input regarding specific questions (see attached) then enter into a general discussion. Comments from that discussion are indicated below:

Lea Tauchen asked how prevalent manganese was in the U.S.; John Cabaniss responded that manganese or MMT impacts about 1/3 of the U.S. fuel supply.

Added to this discussion was that the Auto industry conducted two yearly surveys and detected no MMT in 2/3s of the fuel. Note that MMT can be added to fuel at both the refining level and at fuel farms. Lea further asked why it was necessary to require labeling – the answer was the projected impact on car warranties.

Randy Tackett commented labeling is required for diesel when containing sulfur so why not gas when containing manganese.

John Cabaniss stated he has proof that manganese damages vehicles; will send to me. John indicated that vehicles that use manganese impacts vehicle warranties; auto manufacturers recommend against using MMT. John also surfaced a metallic additives issue.

Michael Hillerby acknowledged that the EPA has approved the use MMT based on the court but specified that MMT does hurt cars. John C. verified that in 94/95 the EPA approved the use of MMT. Lawrence Wah inquired as to an EPA ruling – or other ruling – and if that ruling included a labeling requirement. Lawrence further highlighted the fact that there is no federal manganese labeling requirement.

Alfredo Alonso specified that automakers indicate that MMT is not good for cars: cites that both in Canada and Europe automakers indicate the same. Alfredo further stated the manganese labeling issue may only be applicable to Washoe and Clark county based on the ethanol requirements.

Miles Heller brought up that other fuel additives did not require warnings; this includes warnings in the auto manuals. Additionally, Miles indicated that California has a bounty issue regarding noncompliance issues and is concerned this action may be construed and implemented to the same degree.

Nick Economides could support the "right label" – a practical label that means something to consumers; meaningful in that the label states that the fuel contains **or** not contains manganese. Using "may not" would confuse consumers. Nick also specified that no label should be required if fuel does not contain manganese, that the federal regulators do not say Nevada cannot label, and is concerned as to who would incur liability should the fuel not be labeled.

Peter Krueger indicated that the owners manual recommends using premium fuel; surfaces that owner's manual contains vehicle usage requirements. Additionally, ties in that the owner's manual should comply with federal regulations. He further indicated that AB 453 was rejected at the last legislative session and now NDA is surfacing this issue, again, but in the label form.

Lawrence Wah stated that previous Board of Agriculture decisions did not require manganese labeling; the previous decision was in alignment with EPA labeling requirements. He indicated that the marketers would not know if MMT was present

in the fuel. Lawrence expressed enforcement concerns – specifically once the fuel is introduced into the state. Believes Nevada should follow federal regulations; emphasized that there is no EPA ruling regarding manganese.

Paul Anderson, also a Board of Agriculture Member, is concerned that should the labeling requirement be adopted then the Division of Measurement Standards would not be able to enforce. Paul also contributed the following information that MMT is primarily entering Nevada via Idaho and Utah; also, MMT is being added into the fuel within Nevada as well. California does not ship fuel to Nevada with MMT.

At the conclusion of the workshop John Cabaniss added that there is no data on using MMT on an intermittent basis but that continual use of MMT impacts auto spark plugs and other parts. Nick Economides offered alternative language (refer to Nick's input form) to the label. John Cabaniss also provided additional language to the NAC 590 regarding manganese labeling (see attached).

Attachments:

- Attachment 1 – Manganese Feedback Forms
- Attachment 2 – Flyer's Energy Email Input
- Attachment 3 – United Oil Input Letter
- Attachment 4 – Southwest Research Input Letter
- Attachment 5 – Association of Global Automaker's Proposed NAC 590 Language Revisions
- Attachment 6 – John Cabaniss's 1st Email Input
- Attachment 7 – John Cabaniss's 2nd Email Input
- Attachment 8 – Peter Krueger's Email Input

Notice of Workshop to Solicit Comments on Proposed Regulation

The Nevada Department of Agriculture (Address: 405 South 21st Street, Sparks, NV 89431; Phone: (775) 353-3601) is proposing the Amendment of regulations pertaining to **chapter 590** of the Nevada Administrative Code. A workshop has been set for 9:00 AM, November 13, 2012, at the Nevada Department of Agriculture (Address: 405 South 21st Street, Sparks) large conference room.

Company/Organization Name: Auto Alliance

Industry: Auto

Representative Name, Phone Number and email: Alfredo Alonso

Manganese Labeling Position: For XXX Against ____

Item Number 1 – Definitions	Feedback or Input
Business Impact: (Description of how comment was solicited)	<ul style="list-style-type: none">• Protects Consumers.• Protects Dealers.
Estimated economic effect of proposed regulation on small businesses, include: <ul style="list-style-type: none">• Both adverse and beneficial effects• Both direct and indirect effects	<ul style="list-style-type: none">• Positive knowledge of types of fuels; manganese is harmful to vehicles.• Europe does not approve MMT. (John C will send updated info.)• Informs consumers.

<p>Description of methods that agency considered to reduce impact.</p> <ul style="list-style-type: none"> • Get ideas from the committee or public 	
<p>The estimated cost to the agency for enforcement</p> <ul style="list-style-type: none"> • Specify reason for modification 	N/A
<p>Fees:</p> <ul style="list-style-type: none"> • The agency expects to collect what amount. • What the money will be used for 	No Fees

<p>Statement if regulation duplicates or make more stringent federal, state, or local standards:</p> <ul style="list-style-type: none">• Specify why this regulation may be duplicative or a more stringent provision.	<ul style="list-style-type: none">• Does not believe duplications.• By introducing label requirement into the state then regulation less stringent.
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Company/Organization Name: Association of Global Automakers

Industry: Auto

Representative Name, Phone Number and email: John Cabaniss 202-650-5562

Manganese Labeling Position: For XXX Against ____
* But caveat regarding language on label

Item Number 1 – Definitions	Feedback or Input
Business Impact: (Description of how comment was solicited)	<ul style="list-style-type: none">Minimal impact
Estimated economic effect of proposed regulation on small businesses, include: <ul style="list-style-type: none">Both adverse and beneficial effectsBoth direct and indirect effects	<ul style="list-style-type: none">Beneficial regarding posting of label – with the intent not to have MMT in the fuel.Adverse regarding the fuels.Warranties issues.Metallic additives issues.Stated would provide proof MMT damages vehicles; proof not provided at meeting.

<p>Description of methods that agency considered to reduce impact.</p> <ul style="list-style-type: none"> • Get ideas from the committee or public 	
<p>The estimated cost to the agency for enforcement</p> <ul style="list-style-type: none"> • Specify reason for modification 	N/A
<p>Fees:</p> <ul style="list-style-type: none"> • The agency expects to collect what amount. • What the money will be used for 	No Fees
<p>Statement if regulation duplicates or make more stringent federal, state, or local standards:</p> <ul style="list-style-type: none"> • Specify why this regulation may be duplicative or a more stringent provision. 	<ul style="list-style-type: none"> • None • More stringent because not in federal regulations.

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Company/Organization Name: BP

Industry: Petroleum

Representative Name, Phone Number and email: Miles Heller

Manganese Labeling Position: For XXX Against ____

Three qualifiers

- Labeling required only when MMT added to the fuel.
- PPDs and BOLs (documentation) specifies MMT is present in sufficient language for marketers.
- Language would specify that consumers would comply with owners manuals.

Item Number 1 – Definitions	Feedback or Input
Business Impact: (Description of how comment was solicited)	<ul style="list-style-type: none">• Minimal impact.• Transfer documents must specify MMT in fuel.

<p>Estimated economic effect of proposed regulation on small businesses, include:</p> <ul style="list-style-type: none"> • Both adverse and beneficial effects • Both direct and indirect effects 	<ul style="list-style-type: none"> • Minimal; labels not expensive. • Consumer knowledge beneficial. • No other impacts.
<p>Description of methods that agency considered to reduce impact.</p> <ul style="list-style-type: none"> • Get ideas from the committee or public 	
<p>The estimated cost to the agency for enforcement</p> <ul style="list-style-type: none"> • Specify reason for modification 	N/A
<p>Fees:</p> <ul style="list-style-type: none"> • The agency expects to collect what amount. • What the money will be used for 	No Fees

<p>Statement if regulation duplicates or make more stringent federal, state, or local standards:</p> <ul style="list-style-type: none">• Specify why this regulation may be duplicative or a more stringent provision.	<ul style="list-style-type: none">• Not aware of duplications.
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Company/Organization Name: Champion Chevrolet

Industry: Auto

Representative Name, Phone Number and email: Randy Tackett

Manganese Labeling Position: For XXX Against ____

Item Number 1 – Definitions	Feedback or Input
Business Impact: (Description of how comment was solicited)	<ul style="list-style-type: none">• No impact.
Estimated economic effect of proposed regulation on small businesses, include: <ul style="list-style-type: none">• Both adverse and beneficial effects• Both direct and indirect effects	<ul style="list-style-type: none">• Minimal.• Benefits Consumer

<p>Description of methods that agency considered to reduce impact.</p> <ul style="list-style-type: none"> • Get ideas from the committee or public 	
<p>The estimated cost to the agency for enforcement</p> <ul style="list-style-type: none"> • Specify reason for modification 	N/A
<p>Fees:</p> <ul style="list-style-type: none"> • The agency expects to collect what amount. • What the money will be used for 	No Fees
<p>Statement if regulation duplicates or make more stringent federal, state, or local standards:</p> <ul style="list-style-type: none"> • Specify why this regulation may be duplicative or a more stringent provision. 	<ul style="list-style-type: none"> • Doesn't believe labeling regulation would conflict with federal laws or rules.

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Company/Organization Name: Chevron

Industry: Petroleum

Representative Name, Phone Number and email: Nick Economides

Manganese Labeling Position: For ☐ Against ☒ XXX
* but could support if label language read:

- May contain Manganese or MMT.
- May effect vehicle emission controls.
- Consult you owner's manual.

Item Number 1 – Definitions	Feedback or Input
Business Impact: (Description of how comment was solicited)	<ul style="list-style-type: none">• No business impact regarding the language but there is the obligation to notify the public – public impact.

<p>Estimated economic effect of proposed regulation on small businesses, include:</p> <ul style="list-style-type: none"> • Both adverse and beneficial effects • Both direct and indirect effects 	<ul style="list-style-type: none"> • Minimal to negligible.
<p>Description of methods that agency considered to reduce impact.</p> <ul style="list-style-type: none"> • Get ideas from the committee or public 	<ul style="list-style-type: none"> • Label language similar to the automakers.
<p>The estimated cost to the agency for enforcement</p> <ul style="list-style-type: none"> • Specify reason for modification 	N/A
<p>Fees:</p> <ul style="list-style-type: none"> • The agency expects to collect what amount. • What the money will be used for 	No Fees

<p>Statement if regulation duplicates or make more stringent federal, state, or local standards:</p> <ul style="list-style-type: none">• Specify why this regulation may be duplicative or a more stringent provision.	<ul style="list-style-type: none">• Not duplicative but more stringent.• Aware of no federal regulation; but, it is the right thing to do.
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Company/Organization Name: Nevada Petroleum Marketers Association and CSA

Industry: Petroleum

Representative Name, Phone Number and email: Lawrence Wah

Manganese Labeling Position: For ☐ Against ☒

Item Number 1 – Definitions	Feedback or Input
Business Impact: (Description of how comment was solicited)	<ul style="list-style-type: none">• Labeling requirement will impact outside state (Nevada) suppliers.• Transfer documents would have to reflect MMT present.• Could cause consumer apprehension.
Estimated economic effect of proposed regulation on small businesses, include: <ul style="list-style-type: none">• Both adverse and beneficial effects• Both direct and indirect effects	<ul style="list-style-type: none">• Could have adverse effect – refer to Item 1.• Could diminish the supply to Nevada.

<p>Description of methods that agency considered to reduce impact.</p> <ul style="list-style-type: none"> • Get ideas from the committee or public 	
<p>The estimated cost to the agency for enforcement</p> <ul style="list-style-type: none"> • Specify reason for modification 	N/A
<p>Fees:</p> <ul style="list-style-type: none"> • The agency expects to collect what amount. • What the money will be used for 	No Fees
<p>Statement if regulation duplicates or make more stringent federal, state, or local standards:</p> <ul style="list-style-type: none"> • Specify why this regulation may be duplicative or a more stringent provision. 	<ul style="list-style-type: none"> • More stringent then federal regulations; labeling could cause violation . Clean Air Act Section 211.C.4 (EPA) • Finds the labeling rule a discriminator. • Workshop should be new science to reflect why the workshop is being held.

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Estimated economic effect of proposed regulation on small businesses, include: <ul style="list-style-type: none">• Both adverse and beneficial effects• Both direct and indirect effects	<ul style="list-style-type: none">• Could have adverse effect – refer to Item 1.• Could diminish the supply to Nevada.

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<p>The estimated cost to the agency for enforcement</p> <ul style="list-style-type: none"> • Specify reason for modification 	N/A
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Company/Organization Name: Retail Association of Nevada

Industry: Retail

Representative Name, Phone Number and email: Lea Tauchen 202-650-5562

Manganese Labeling Position: For ☐ Against ☒

Item Number 1 – Definitions	Feedback or Input
Business Impact: (Description of how comment was solicited)	<ul style="list-style-type: none">• Concerned with liability issues.• Concerned with enforcement and compliance of labeling issues.
Estimated economic effect of proposed regulation on small businesses, include: <ul style="list-style-type: none">• Both adverse and beneficial effects• Both direct and indirect effects	<ul style="list-style-type: none">• Adverse costs and administrative monitoring.• Liability issues.

<p>Description of methods that agency considered to reduce impact.</p> <ul style="list-style-type: none"> • Get ideas from the committee or public 	
<p>The estimated cost to the agency for enforcement</p> <ul style="list-style-type: none"> • Specify reason for modification 	N/A
<p>Fees:</p> <ul style="list-style-type: none"> • The agency expects to collect what amount. • What the money will be used for 	No Fees
<p>Statement if regulation duplicates or make more stringent federal, state, or local standards:</p> <ul style="list-style-type: none"> • Specify why this regulation may be duplicative or a more stringent provision. 	<ul style="list-style-type: none"> • No duplication. • But it may be more stringent.

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Company/Organization Name: Western States Petroleum Association

Industry: Petroleum

Representative Name, Phone Number and email: Gina Grey

Manganese Labeling Position: For ☐ Against ☐ No Comment ☒

Item Number 1 – Definitions	Feedback or Input
Business Impact: (Description of how comment was solicited)	
Estimated economic effect of proposed regulation on small businesses, include: <ul style="list-style-type: none">• Both adverse and beneficial effects• Both direct and indirect effects	

<p>Description of methods that agency considered to reduce impact.</p> <ul style="list-style-type: none"> • Get ideas from the committee or public 	
<p>The estimated cost to the agency for enforcement</p> <ul style="list-style-type: none"> • Specify reason for modification 	N/A
<p>Fees:</p> <ul style="list-style-type: none"> • The agency expects to collect what amount. • What the money will be used for 	No Fees
<p>Statement if regulation duplicates or make more stringent federal, state, or local standards:</p> <ul style="list-style-type: none"> • Specify why this regulation may be duplicative or a more stringent provision. 	

Mr. Dave Jones
Administrator
Division of Measurement Standards
Nevada Department of Agriculture
2150 Frazer Ave
Sparks, NV 89431

Reference:
Proposed Labeling of Fuel Pumps Dispensing Fuel containing Manganese: Amendment to NAC 590

Dear Mr. Jones:

As a small business owner marketing fuel in Nevada, I am deeply concerned about the proposal before the Nevada Department of Agriculture to "label" our fuel pumps if we choose to use a safe and effective gasoline that may contain a manganese-based additive.

For over 30 years, we have served Nevada's gasoline consumers and have been a trusted source for high quality petroleum, supplying customers throughout the state. We pride ourselves in offering a cost-effective alternative to the often-higher priced major oil and gas companies, along with the local jobs we bring to this state.

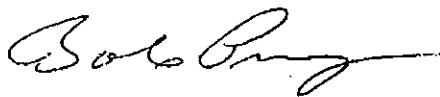
This misguided proposal would force our business to label a legal safe product (manganese octane additive for gasoline), which is approved for use by the Federal government and in 48 other states. No state has ever considered labeling of this product, nor is there any need, since this product has been proven safe and effective over decades of use and more importantly is legal.

Enacting this proposal would cost Nevada jobs, remove competition in the market, will impose unneeded and onerous regulations on small businesses and may cost the state potentially hundreds of thousands of dollars. This was debated and rejected twice before, including the rejected state legislation AB453. This proposal is another attempt by out of state, special interests to create regulations that will benefit a very few large companies at the expense of local Nevada businesses.

At a time when we need to focus our attention on creating growth in our state and improving our economy, this is not the direction we should go. We encourage you to work together with local Nevada interests to ensure that this type burdensome and needless regulation does not take place.

Please feel free to contact us at any time to discuss.

Sincerely,



Bob Prary
Nevada Supply Manager
Flyers Energy, LLC

David Michael Jones

From: Bob Prary Jr. [bobb@4flyers.com]
Sent: Wednesday, November 07, 2012 2:43 PM
To: David Michael Jones
Subject: Pump Labeling in Nevada
Attachments: 20121102152724369.pdf

Good afternoon Mr. Jones.

Please see the attached letter expressing our opposition to pump labeling for MMT in Nevada.

I appreciate your time and consideration.

Sincerely,

Bob Prary



147 S. Stanford Way
Sparks, NV 89431
(775) 359-2721 Ext. 2840
(775) 359-3429 Fax
(775) 848-3869 Cell

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11/8/2012

United Oil

POST OFFICE BOX 5159
220 EASTLAND DRIVE SOUTH
TWIN FALLS, ID 83303-5159
PH. (208) 733-7033 or 1-800-228-8864
FAX (208) 733-6129

Mr. Dave Jones
Administrator
Division of Measurement Standards
Nevada Department of Agriculture
2150 Frazer Ave
Sparks, NV 89431

Reference:

Proposed Labeling of Fuel Pumps Dispensing Fuel containing Manganese: Amendment to NAC 590

Dear Mr. Jones:

Our company markets fuel into small towns and rural regions of North East Nevada. I recently became aware of a proposal before the Nevada Department of Agriculture to require labeling of fuel pumps if we market manganese additized gasoline.

Our company has supplied the highest quality fuels to our Nevada customers for over 65 years. Some of that fuel has manganese additive....some does not. It depends upon the octane and the origin of the product.

This proposal would require us to be continuously adding and removing labels. Further, we would have to create an accounting system to track the fuel and the labels at each location in order to assure compliance.

I am lost to see how labeling brings any benefit to anyone. Manganese additives have been in use in the US and world wide for decades. They are approved by the EPA. They do not violate any vehicle warranties. They are compatible with all other required additives. They increase octane.

This 'labeling proposal' is a solution searching for a problem where none exists.

In most of the area of Nevada where we market, we are the sole source of fuel. We drive hundreds of miles on dirt roads and very quiet highways to serve our customers. At times we wonder if it makes good business sense. A further piling on of unneeded regulations increases our cost of doing business. We will be forced to pass those new costs on to our Nevada customers, or discontinue serving them.

Labeling manganese additives is a bad idea that should be dismissed. Please call me at 208-733-7033 if I can be of any help.

Sincerely,



Robert L. Franklin

President

SOUTHWEST RESEARCH INSTITUTE®

8220 CULEBRA RD. 78238-5166 • P.O. DRAWER 28510 78228-0510 • SAN ANTONIO, TEXAS, USA • (210) 684-5111 • WWW.SWRI.ORG

June 4, 2012

Mr. Michael D. Hillerby
Hillerby & Associates
4747 Caughlin Parkway
Reno, NV 89519

Subject: Gasoline Analysis Capabilities

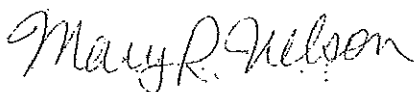
Dear Mr. Hillerby:

It has come to our attention that you may be interested in our analytical capabilities. We have extensive experience in the testing of petroleum fuels and lubricants, and would be happy to offer our assistance. The particular testing mentioned was for manganese content in gasoline. We currently offer ASTM method D3831, Manganese in Gasoline by Atomic Absorption Spectrometry. The cost per sample is \$57.00, and we request 50ml for each analysis. The scope of the method covers the determination of the total manganese content, present as manganese tricarbonyl, of gasoline within the concentration range of 0.25 to 40 mg/l of manganese.

I would be pleased to email a copy of our complete capabilities, including laboratory certifications, at your earliest convenience. Please be so kind as to contact me at becky.nelson@swri.org.

If you have any questions or need any additional information, do not hesitate to call at (210) 522-2181. We would appreciate the opportunity to be of service to your firm and look forward to talking with you.

Sincerely,



Mary R. Nelson
Senior Research Scientist
Petroleum Products Research
Automotive Products and
Emissions Research Division

(D3831 testing)
page 1 of 1



HOUSTON, TEXAS (713) 977-1377 • WASHINGTON, DC (301) 881-0226

CHAPTER 590 - MOTOR VEHICLE FUEL, PETROLEUM PRODUCTS AND ANTIFREEZE

ANTIFREEZE

- 590.010 Adoption by reference of specifications for antifreeze; additional specifications.
- 590.015 Inspection fee.
- 590.020 Prohibited acts.
- 590.030 Adoption by reference of standards for prediluted antifreeze.
- 590.035 Availability of Volume 15.05, "Engine Coolants," of *2001 Annual Book of ASTM Standards*.

FUELS

- 590.041 "Gallon" defined.
- 590.045 Availability of Volumes 05.01 and 05.02, "Petroleum Products and Lubricants," of *2002 Annual Book of ASTM Standards*.
- 590.050 Diesel fuel: Adoption by reference of specifications; posting of grade for diesel fuel oil.
- 590.051 Biodiesel and diesel fuel: Adoption by reference of standards; requirements for certain biodiesel fuel blends.
- 590.052 M-85 fuel methanol: Adoption by reference of specifications.
- 590.053 E-85 fuel methanol: Adoption by reference of specifications.
- 590.054 Hydrogen: Adoption by reference of specifications; restrictions on hydrogen sold or supplied in State.
- 590.055 Aviation fuel: Adoption by reference of specifications.
- 590.061 Gasoline: Adoption by reference of antiknock index for testing octane rating; determination of octane rating number; proof of transfer of fuel.
- 590.063 Gasoline: Posting of octane rating number on pump or other device; required accuracy of rating number.
- 590.065 Gasoline: Adoption by reference of specifications; limitations on vapor pressure; minimum temperatures for vapor lock; limitations on contents.
- 590.066 Gasoline: Request for variance from compliance with motor vehicle fuel standards.
- 590.070 Administrative penalties for sale of nonconforming fuel.

LIQUEFIED PETROLEUM GAS

General Provisions

- 590.100 Definitions.
- 590.110 "Approved" defined.
- 590.120 "Board" defined.
- 590.130 "Building" defined.
- 590.140 "Container" defined.
- 590.150 "Cylinder" defined.
- 590.160 "LP gas" defined.
- 590.190 "Property line" defined.

Licensing and Practice

- 590.235 Unlicensed installation, facility or service: Operation or supply unlawful; recovery of license fees and investigative costs and imposition of penalty fees.
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- 590.253 Qualified persons: Connection with or employment by licensee or applicant required for issuance or renewal of certain licenses; performance of safety sensitive functions.
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590.290 Holder of class 1 or class 2 license: Provision of certain information and notice; response to certain requests.

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590.315 Certificate of competency: Application; reexamination without additional fee; additional certificate of competency without additional fee.

590.320 Certificate of competency: Examination of applicant or holder; waiver of examination.

590.340 Certificate of competency: Issuance.

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590.365 Certificate of competency: Approval of courses for continuing education.

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590.450 Installation for dispensing LP gas for resale.

590.452 Installation and modification of LP gas equipment.

590.454 Installation for dispensing LP gas.

590.456 Installation of cabinet for LP gas cylinder exchange.

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590.480 Installation of underground tank; removal of abandoned tank.

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590.600 Adoption by reference of regulations for liquefied petroleum gas.

590.610 Adoption by reference of regulations for fuel gas.

590.615 Adoption by reference of regulations for use of flame effects before audience.

590.620 Adoption by reference of regulations for manufactured home installations, sites and communities.

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590.657 Procedure following investigation of informal complaint; notice of hearing and formal complaint; answer.

590.660 Joining of formal complaints.

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590.765 Operator to notify Division of civil action for damages; submission of order of judgment or settlement agreement required for payment from Fund.

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FEE FOR CERTAIN FUELS AND HEATING OIL

590.800 Payment by dealers and suppliers.

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FUELS

NAC 590.041 "Gallon" defined. (NRS 590.070) As used in NAC 590.041 to 590.070, inclusive, unless the context otherwise requires, "gallon" means 231 cubic inches.

(Added to NAC by Dep't of Agriculture, eff. 3-27-92; A by Bd. of Agriculture, 11-18-93; R145-98, 12-14-98; R064-01, 12-17-2001; R010-09, 10-27-2009)

NAC 590.045 Availability of Volumes 05.01 and 05.02, "Petroleum Products and Lubricants," of 2002 Annual Book of ASTM Standards. (NRS 590.070, 590.073, 590.100)

1. Volumes 05.01 and 05.02, "Petroleum Products and Lubricants," of the 2002 *Annual Book of ASTM Standards*, are available for inspection at the office of the State Department of Agriculture, 350 Capitol Hill Avenue, Reno, Nevada 89502, and 2300 McLeod Street, Las Vegas, Nevada 89104.

2. The volumes may be purchased at a cost of \$361 from ASTM International, 100 Barr Harbor Drive, West Conshohocken, Pennsylvania 19428.

(Added to NAC by St. Sealer of Weights & Measures, eff. 3-5-90; A by Dep't of Agriculture, 3-27-92; A by St. Sealer of Weights & Measures, 11-18-93; A by Bd. of Agriculture, 8-9-94; R145-98, 12-14-98; A by St. Sealer of Weights & Measures by R149-98, 12-14-98; A by Bd. of Agriculture by R176-01, 5-31-2002)

NAC 590.061 Gasoline: Adoption by reference of antiknock index for testing octane rating; determination of octane rating number; proof of transfer of fuel. (NRS 590.070, 590.100)

1. The State Board of Agriculture hereby adopts by reference the antiknock index for testing the octane rating of gasoline that is defined in Volume 05.02, "Petroleum Products and Lubricants," of the 2002 *Annual Book of ASTM Standards*, ASTM designation D4814-01a.

2. Gasoline that is brought into this State for delivery to a person in this State must have an octane rating number which is determined by the antiknock index method described in subsection 1.

3. A person who transfers fuel to a person in this State, other than the consumer of the fuel, shall provide a proof of transfer to the person receiving the fuel. The proof of transfer must be:

- (a) A delivery ticket;
- (b) An invoice;
- (c) A bill of lading;
- (d) A bill of sale;
- (e) A terminal ticket; or
- (f) Any other proof of transfer that is approved by the State Board of Agriculture.

4. The proof of transfer must contain:

- (a) The name of the person making the transfer;
- (b) The name of the person to whom the fuel is transferred;
- (c) The date of the transfer; and

(d) If the fuel is gasoline, the octane rating number of the gasoline.

(e) If the fuel is gasoline, an express statement whether it contains manganese or MMT (Methylcyclopentadienyl Manganese Tricarbonyl).

5. The person receiving the fuel must keep a copy of the proof of transfer at the location at which the fuel was received for not less than 30 days after the date of the delivery of the fuel. After that period, the proof of transfer must be retained at any location for not less than 1 year after the date of the delivery of the fuel and be made available to the State Department of Agriculture upon request.

6. Any other test method may be used if the State Sealer of Weights and Measures determines that another method produces results equivalent to the results of the specified method. A method approved by ASTM International that has not yet been published shall be deemed to meet the appropriate criteria.

(Added to NAC by St. Sealer of Weights & Measures, eff. 10-23-91; A 11-18-93; A by Bd. of Agriculture by R145-98, 12-14-98; R176-01, 5-31-2002)

NAC 590.063 Gasoline: Posting of octane rating number on pump or other device; required accuracy of rating number. (NRS 590.070, 590.100)

1. The octane rating number of the gasoline from the proof of transfer must be posted on the pump or other device for dispensing the gasoline.

2. The octane rating number of the product that is in the pump or other device for dispensing gasoline must not be lower than the octane rating that is posted on the pump or device.

(Added to NAC by St. Sealer of Weights & Measures, eff. 10-23-91; A by Bd. of Agriculture, 2-20-96)

NAC 590.065 Gasoline: Adoption by reference of specifications; limitations on vapor pressure; minimum temperatures for vapor lock; limitations on contents. (NRS 561.105, 590.070)

1. Except as otherwise provided in this section, the State Board of Agriculture hereby adopts by reference ASTM D4814, "Standard Specification for Automotive Spark-Ignition Engine Fuel," contained in Volume 05.02, "Petroleum Products and Lubricants," of the 2009 *Annual Book of ASTM Standards*, as that standard existed on July 1, 2009, and any subsequent revision of that standard published by ASTM International that is approved by the State Board of Agriculture pursuant to this section for use in this State. The standard may be purchased from ASTM International, 100 Barr Harbor Drive, West Conshohocken, Pennsylvania 19428-2959, or at the Internet address <http://www.astm.org>, for the price of \$53.

2. The State Board of Agriculture will review each revision of ASTM D4814 that is published after July 1, 2009, to ensure its suitability for use in this State. If the State Board of Agriculture

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fails to approve or disapprove such a revision within 120 days after its date of publication, the revision shall be deemed approved by the State Board of Agriculture for use in this State. The State Board of Agriculture will file a copy of each revision which it approves or which is deemed approved pursuant to this section with the Secretary of State and the State Library and Archives Administrator. The most recent revision that is approved by the State Board of Agriculture will be available for inspection at the State Department of Agriculture, 405 South 21st Street, Sparks, Nevada 89431.

3. Notwithstanding the provisions of Table 4 ("Schedule of Seasonal and Geographical Volatility Classes") of ASTM D4814 that apply to this State, the schedule that is designated in Table 4 for the area of this State that lies north of the 38th degree of north latitude applies to the entire area of this State unless the United States Environmental Protection Agency requires a county to comply with a different requirement relating to vapor pressure.

4. Except as otherwise provided in subsection 6, gasoline:

(a) Sold between June 1 and September 15 of each calendar year containing:

(1) Not less than 9 percent ethanol by volume and not more than 10 percent ethanol by volume must not exceed the limits for vapor pressure set forth in ASTM D4814 by more than 1 pound per square inch.

(2) Less than 9 percent ethanol by volume must not exceed the limits specified in ASTM D4814.

(b) Sold during any other period in a calendar year containing not more than 10 percent ethanol by volume must not exceed the limits specified in ASTM D4814 by more than 1 pound per square inch.

5. Until May 1, 2012, or until ASTM D4814 is amended to incorporate changes to the minimum temperature for vapor lock for the following classes to include the effects of volatility of not more than 10 percent of ethanol by volume, whichever occurs first, the minimum temperature for a vapor-liquid ratio of 20 for the applicable class of vapor lock protection for a blend of gasoline and ethanol is:

(a) For class 1, 54 degrees Centigrade (129 degrees Fahrenheit).

(b) For class 2, 50 degrees Centigrade (122 degrees Fahrenheit).

(c) For class 3, 47 degrees Centigrade (116 degrees Fahrenheit).

(d) For class 4, 41.5 degrees Centigrade (107 degrees Fahrenheit).

(e) For class 5, 39 degrees Centigrade (102 degrees Fahrenheit).

(f) For class 6, 35 degrees Centigrade (95 degrees Fahrenheit).

↪ Gasoline and any blend of gasoline and ethanol that is sold in the area of this State which is east of the 117th degree of west longitude and north of the 38th degree of north latitude must meet the minimum temperatures for vapor lock protection set forth in ASTM D4814.

6. Gasoline and any blend of gasoline and ethanol sold in Clark County between October 1 and the following March 31 must not exceed a vapor pressure of 13.5 pounds per square inch.

7. A person shall not sell, offer for sale, supply or offer to supply in this State any gasoline intended for use in a vehicle which is primarily driven on a highway if:

(a) It contains more than 0.05 gram of lead per gallon;

(b) It contains more than 0.005 gram of phosphorus per gallon;

(c) It contains more than 10 percent ethanol by volume; or

(d) It contains more than 95 parts per million of sulfur.

8. Any pump dispensing gasoline for sale to a consumer which contains manganese or MMT, as stated in the transfer documents required in NAC 590.061(4)(e), must be affixed with a label (minimum 4" x 4", yellow background) placed prominently on the upper one-third of the pump

surface facing the consumer, as prescribed by the Department which includes the following information:

- (a) Attention: Read before you pump
- (b) Gasoline sold here may contain manganese or MMT
- (c) Some automakers recommend against using fuel containing manganese or MMT
- (d) Resulting damage may not be covered by warranty
- (e) Check your owner's manual before fueling

The label shall be affixed to any pump dispensing gasoline delivered within the previous six (6) months which contained manganese or MMT as noted on the transfer documents pursuant to NAC 590.061(4)(e).

§10. Any other test method may be used if the State Sealer of Weights and Measures determines that another method produces results equivalent to the results of the specified method. A method approved by ASTM International that has not yet been published shall be deemed to meet the appropriate criteria.

(Added to NAC by Bd. of Agriculture, eff. 3-5-90; A by Dep't of Agriculture, 3-27-92; A by Bd. of Agriculture, 11-18-93; 11-2-94; 2-20-96; 10-22-97; R145-98, 12-14-98; R176-01, 5-31-2002; R002-04, 9-21-2004; R111-08, 1-28-2010; R032-10, 6-30-2010)

NAC 590.066 Gasoline: Request for variance from compliance with motor vehicle fuel standards. (NRS 590.070)

1. Except as otherwise provided in subsection 6, a supplier may submit a request to the Director of the State Department of Agriculture or the Director's designee for a variance of not more than 30 days to supply motor vehicle fuel that does not meet the standards set forth in NAC 590.065 if the supplier demonstrates that a disruption in supply exists or is imminent.
2. If a supplier requests a variance pursuant to subsection 1, the supplier shall provide the following information in writing to the Director or the Director's designee:
 - (a) The specific supply conditions that may result in a shortage of motor vehicle fuel, without disclosing any proprietary information of the supplier;
 - (b) The specific geographic area to which the variance will apply;
 - (c) The period for which the variance will be in effect; and
 - (d) The type of motor vehicle fuel proposed for distribution or sale.
3. The Director or the Director's designee shall notify:
 - (a) The supplier in writing within 24 hours after receipt of the request for a variance as to whether the request is granted, unless otherwise agreed upon by both parties. Approval of a variance must be based on information which demonstrates that a disruption in supply exists or is imminent, and such approval is applicable to all suppliers within the specified geographic area for the approved period.
 - (b) The Motor Carrier Division of the Department of Motor Vehicles and other interested parties of any variance granted by the State Department of Agriculture. A list of interested parties must be kept on file by the State Department of Agriculture.
4. The Director or the Director's designee may authorize an extension of a variance approved pursuant to this section, not to exceed 30 days, if the supplier demonstrates in writing that the conditions identified in the initial request continue to exist.
5. Except as otherwise provided in NRS 239.010, the Director or the Director's designee shall keep confidential any proprietary or competitively sensitive information specific to the supplier which the Director or the Director's designee acquires during the process of granting or denying

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a variance pursuant to this section and shall not disclose the information to the public or any other state agency or entity.

6. A variance may not be granted pursuant to this section if the motor vehicle fuel is to be sold in a geographic area for which fuel specifications are prescribed in the State Implementation Plan.

7. Approval of a variance by the Director or the Director's designee does not waive the reporting requirements or any applicable taxes and fees pursuant to chapters 360A, 365, 366, 373 and 590 of NRS.

8. As used in this section:

(a) "Disruption in supply" means an unusual condition, either natural or man-made, that may impede the production, transportation, distribution or sale of motor vehicle fuel which meets the standards set forth in NAC 590.065 in sufficient quantity to meet sustainable demands.

(b) "State Implementation Plan" has the meaning ascribed to it in NAC 486A.125.

(c) "Supplier" has the meaning ascribed to it in NRS 365.084.

(Added to NAC by Bd. of Agriculture by R010-09, eff. 10-27-2009)

NAC 590.070 Administrative penalties for sale of nonconforming fuel. (NRS 590.071)

For any violation of the provisions of ~~NRS 590.070~~ NAC Chapter 590, including any violation of standards relating to diesel fuel, the failure to maintain proper records, or the failure to properly label pumps, the State Board of Agriculture may:

1. For the first violation, issue a written warning, impose a fine of not more than \$2,000 for each day the violation continues, or issue a warning and impose a fine.

2. For the second violation, impose a fine of not more than \$3,500 for each day the violation continues.

3. For the third or subsequent violation, impose a fine of not more than \$5,000 for each day the violation continues.

(Added to NAC by Bd. of Agriculture, eff. 3-5-90; A 11-2-92)

David Michael Jones

From: John Cabaniss [jcabaniss@globalautomakers.org]
Sent: Friday, November 30, 2012 11:14 AM
To: David Michael Jones
Cc: William S. Striejewski; Valerie Ughetta; Michael Hillerby; Alfredo Alonso; John Cabaniss
Subject: Comments on Pump Label for Manganese Containing Gasoline
Importance: High
Attachments: Final Joint Letter Nevada MMT Label 11.30.2012.pdf; WWFC1.pdf; Proposed NAC 590 amendments 11 7 2012 (2).pdf; Nevada sample label 11 7 2012 v4 4x4 (2).pdf; Sample OM MMT language.pdf

Dear Mr. Jones:

Attached is a joint letter from the Association of Global Automakers and the Alliance of Automobile Manufacturers on the proposal for labeling gasoline pumps which dispense gasoline containing manganese additives. Please contact me if further information is needed or if you have any questions.

Thanks for your assistance.

Best regards.

John Cabaniss

John M. Cabaniss, Jr.
Director, Environment & Energy
Association of Global Automakers, Inc.
1050 K Street, NW Suite 650
Washington, DC 20001
202.650.5562 (direct)
202.650.5555 (main)



12/3/2012



GlobalAutomakers

November 30, 2012

Mr. David M. Jones
Administrator
Bureau of Weights and Measures
Nevada Department of Agriculture
2150 Frazer Avenue
Sparks, NV 89431

RE: Metallic Additives for Gasoline (Follow up to November 13, 2012 Workshop)
[Submitted electronically with all enclosures attached on November 30, 2012]

Dear Mr. Jones:

This letter confirms information provided by the representatives of the Association of Global Automakers¹ and the Alliance of Automobile Manufacturers² at your Department's November 13, 2012 public workshop on this matter. Global Automakers and the Auto Alliance together represent all major auto manufacturers selling passenger cars and light trucks in the U.S. Our members appreciate the opportunity provided by the workshop and look forward to a constructive outcome soon on this issue of great concern.

1. No Automaker Supports Use of Metallic Additives in Gasoline

As you are aware, automakers in the United States, and indeed world-wide, have had longstanding and ongoing opposition to the use of metallic additives, such as manganese or MMT

¹ Global Automakers members include Aston Martin, Ferrari, Honda, Hyundai, Isuzu, Kia, Maserati, McLaren, Nissan, Peugeot, Subaru, Suzuki, and Toyota.

² Auto Alliance members include BMW, Chrysler, Ford, General Motors, Jaguar Land Rover, Mazda, Mercedes-Benz, Mitsubishi, Porsche, Toyota, Volkswagen, and Volvo.

(Methylcyclopentadienyl Manganese Tricarbonyl), in gasoline³. In numerous studies, the prolonged, consistent use of manganese-based gasoline additives has been shown to result in damage to vehicles, such as premature spark plug fouling and damage to emissions control equipment, including catalytic converters. Detailed information on these studies has been provided previously to the Department. We understand that this information is available from Mr. Bill Striejewski at the Department of Agriculture. This information is incorporated by reference. Please advise if you need additional copies of any of this information.

As we noted at the workshop, these studies are still relevant to today's emerging vehicle engine and emission control technologies and materials. Additional data are not needed to establish the ongoing risk documented in these studies. Thus we would have preferred continuing the ban on manganese based additives in Nevada.

2. Absent a ban on use, at a minimum, consumers have a right to know that metallic additives are present in their fuels, and to be advised to check their vehicle owner's manuals.

For many years, various fuel surveys have not identified metallic additives or MMT as present in gasoline in the U.S. However, given the apparent interest on the part of some Nevada gasoline distributors and marketers to now use manganese based gasoline additives, such as MMT, we believe it is imperative that *at a minimum* the Nevada Department of Agriculture adopt and enforce consumer labeling requirements for gasoline pumps which dispense gasoline containing manganese or MMT. Disclosure through the use of a pump label is the only means of informing consumers so they can make an informed choice when purchasing gasoline. Global Automakers and the Auto Alliance fully support a requirement for labeling pumps which dispense gasoline containing intentionally added manganese or MMT.

Because of the potential for vehicle damage, many automakers include information in their owner's manuals recommending against the use of gasoline containing manganese or MMT. Enclosed is a sample of the owner's manual information for several major automakers, including Chrysler, Ford, General Motors, Honda, Subaru, and Toyota. Together these automakers (and others that recommend against metallic additives) comprise the vast majority of new vehicle sales in Nevada.

In order for consumers to make informed choices concerning the fuel they are purchasing, they need to be made aware if the fuel contains manganese or MMT, that using it can result in damage, and that they should check their owner's manual before fueling. The addition of a pump label is inexpensive and results in little administrative burden for the Department or the fuel marketers.

3. Joint OEM Proposal for Pump Labeling

At the workshop on November 13, 2012, our representatives provided the following documents for your consideration (copies enclosed):

³ See enclosed 4th edition of the Worldwide Fuel Charter, especially the section on category 4 which applies to gasoline sold in markets with advanced vehicle emissions controls such as the U.S. A fifth edition is expected to be published in early 2013, and will continue to recommend against metallic additive use.

1. A redline/strikeout version of portions of NAC Chapter 590 with amendments to provide for:
 - a. Requirement for labeling dispensers for fuel which may contain manganese or MMT; see proposed new section 590.065 (8)
 - b. Requirement for disclosure of manganese or MMT in fuel transfer documents; see proposed new section 590.061 (4)(e)
 - c. Clarification of enforcement authority for labeling and recordkeeping; see proposed amendments to section 590.070
2. A sample pump label containing the language included in our proposed amendments to section 590.065

As explained at the workshop, the first provision (1.a) noted above would address the label and its content. The second provision (1.b) above would require the disclosure information on fuel transfer documents to allow marketers to know when they need to affix pump labels and the Department the paper trail needed to enforce the labeling requirement. The third provision (1.c) would clarify the Department's enforcement authority. These elements, along with the sample pump label, are all necessary to ensure adequate and correct information for consumers.

4. Responses to the Workshop Discussion

At the workshop several points were discussed that are worthy of further mention.

First, one workshop attendee provided alternative language for the pump label and suggested that it would be worthwhile for interested parties to agree on a simpler label than we proposed. We are open to further discussions on the specific label language, as long as the label is prominently displayed on the pump in a manner in which it will get consumers' attention and the basic messages include:

1. Disclosure of presence of manganese or MMT
2. The potential for damage if used
3. Referring the consumer to his/her owner's manual

Second, another attendee raised a question regarding automakers' efforts in other States to require similar pump labels for gasoline containing manganese or MMT. Automakers and others conduct fuel surveys across the U.S. to gauge the quality of gasoline sold regionally and nationally. Despite EPA approval in the mid-1990s of MMT as a gasoline additive for some gasoline sold in the U.S., to date we had not been aware of any use of manganese additives in gasoline sold in the U.S. Metallic additives, including MMT, are prohibited in Federal reformulated gasoline (which represents about one-third of the U.S., non-California gasoline pool) and in all gasoline sold in California.

To our knowledge, Nevada is the first State where distributors and marketers have shown any significant interest in using manganese or MMT additives. However, based on the discussions in Nevada, we are currently reviewing the markets in other nearby western states and across the U.S. to determine whether outreach, or at a minimum, similar labeling requirements, may be warranted. Additionally, EPA regulations do not allow refiners or blenders to use MMT and ethanol in the same batch of gasoline.⁴

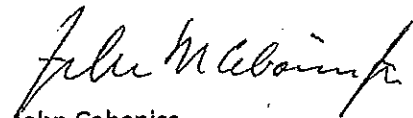
⁴ Telecon with EPA staff on November 26, 2012.

The EPA renewable fuels standard has resulted in the widespread use of ethanol in gasoline across the U.S., and as a result there is little use of MMT.

Third, another attendee raised a question concerning "over-the-counter" packaged gasoline additives for consumer use, some of which contain manganese or MMT. While automakers have not taken a position on the use of manganese in over-the-counter additives, we suspect that such products are seldom used on a continuous basis by consumers. Instead, these products are usually used intermittently. While automakers don't support manganese use even intermittently, we have no data on which to gauge the impacts of such additives when used occasionally.

Thank you for the opportunity to comment on this important consumer issue in Nevada. If you need further information, please feel free to contact either John Cabaniss of Global Automakers (icabaniss@globalautomakers.org; (202) 650-5562) or Valerie Ughetta of the Auto Alliance (vughetta@autoalliance.org; (202) 326-5549).

Sincerely yours,



John Cabaniss
Director, Environment & Energy
Global Automakers



Valerie Ughetta
Director, Automotive Fuels
Auto Alliance

cc: Bill Striejewski, NV Department of Agriculture

Enclosures

Worldwide Fuel Charter (4th ed.)
Examples of Current Vehicle Owner's manual language
Proposed regulatory amendments
Sample label



GlobalAutomakers

November 30, 2012

Mr. David M. Jones
Administrator
Bureau of Weights and Measures
Nevada Department of Agriculture
2150 Frazer Avenue
Sparks, NV 89431

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As we noted at the workshop, these studies are still relevant to today's emerging vehicle engine and emission control technologies and materials. Additional data are not needed to establish the ongoing risk documented in these studies. Thus we would have preferred continuing the ban on manganese based additives in Nevada.

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For many years, various fuel surveys have not identified metallic additives or MMT as present in gasoline in the U.S. However, given the apparent interest on the part of some Nevada gasoline distributors and marketers to now use manganese based gasoline additives, such as MMT, we believe it is imperative that *at a minimum* the Nevada Department of Agriculture adopt and enforce consumer labeling requirements for gasoline pumps which dispense gasoline containing manganese or MMT. Disclosure through the use of a pump label is the only means of informing consumers so they can make an informed choice when purchasing gasoline. Global Automakers and the Auto Alliance fully support a requirement for labeling pumps which dispense gasoline containing intentionally added manganese or MMT.

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 - a. Requirement for labeling dispensers for fuel which may contain manganese or MMT; see proposed new section 590.065 (8)
 - b. Requirement for disclosure of manganese or MMT in fuel transfer documents; see proposed new section 590.061 (4)(e)
 - c. Clarification of enforcement authority for labeling and recordkeeping; see proposed amendments to section 590.070
2. A sample pump label containing the language included in our proposed amendments to section 590.065

As explained at the workshop, the first provision (1.a) noted above would address the label and its content. The second provision (1.b) above would require the disclosure information on fuel transfer documents to allow marketers to know when they need to affix pump labels and the Department the paper trail needed to enforce the labeling requirement. The third provision (1.c) would clarify the Department's enforcement authority. These elements, along with the sample pump label, are all necessary to ensure adequate and correct information for consumers.

4. Responses to the Workshop Discussion

At the workshop several points were discussed that are worthy of further mention.

First, one workshop attendee provided alternative language for the pump label and suggested that it would be worthwhile for interested parties to agree on a simpler label than we proposed. We are open to further discussions on the specific label language, as long as the label is prominently displayed on the pump in a manner in which it will get consumers' attention and the basic messages include:

1. Disclosure of presence of manganese or MMT
2. The potential for damage if used
3. Referring the consumer to his/her owner's manual

Second, another attendee raised a question regarding automakers' efforts in other States to require similar pump labels for gasoline containing manganese or MMT. Automakers and others conduct fuel surveys across the U.S. to gauge the quality of gasoline sold regionally and nationally. Despite EPA approval in the mid-1990s of MMT as a gasoline additive for some gasoline sold in the U.S., to date we had not been aware of any use of manganese additives in gasoline sold in the U.S. Metallic additives, including MMT, are prohibited in Federal reformulated gasoline (which represents about one-third of the U.S., non-California gasoline pool) and in all gasoline sold in California.

To our knowledge, Nevada is the first State where distributors and marketers have shown any significant interest in using manganese or MMT additives. However, based on the discussions in Nevada, we are currently reviewing the markets in other nearby western states and across the U.S. to determine whether outreach, or at a minimum, similar labeling requirements, may be warranted. Additionally, EPA regulations do not allow refiners or blenders to use MMT and ethanol in the same batch of gasoline.⁴

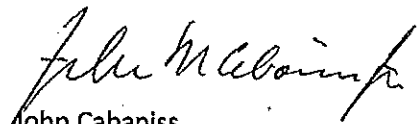
⁴ Telecon with EPA staff on November 26, 2012.

The EPA renewable fuels standard has resulted in the widespread use of ethanol in gasoline across the U.S., and as a result there is little use of MMT.

Third, another attendee raised a question concerning "over-the-counter" packaged gasoline additives for consumer use, some of which contain manganese or MMT. While automakers have not taken a position on the use of manganese in over-the-counter additives, we suspect that such products are seldom used on a continuous basis by consumers. Instead, these products are usually used intermittently. While automakers don't support manganese use even intermittently, we have no data on which to gauge the impacts of such additives when used occasionally.

Thank you for the opportunity to comment on this important consumer issue in Nevada. If you need further information, please feel free to contact either John Cabaniss of Global Automakers (icabaniss@globalautomakers.org; (202) 650-5562) or Valerie Ughetta of the Auto Alliance (vughetta@autoalliance.org; (202) 326-5549).

Sincerely yours,



John Cabaniss
Director, Environment & Energy
Global Automakers

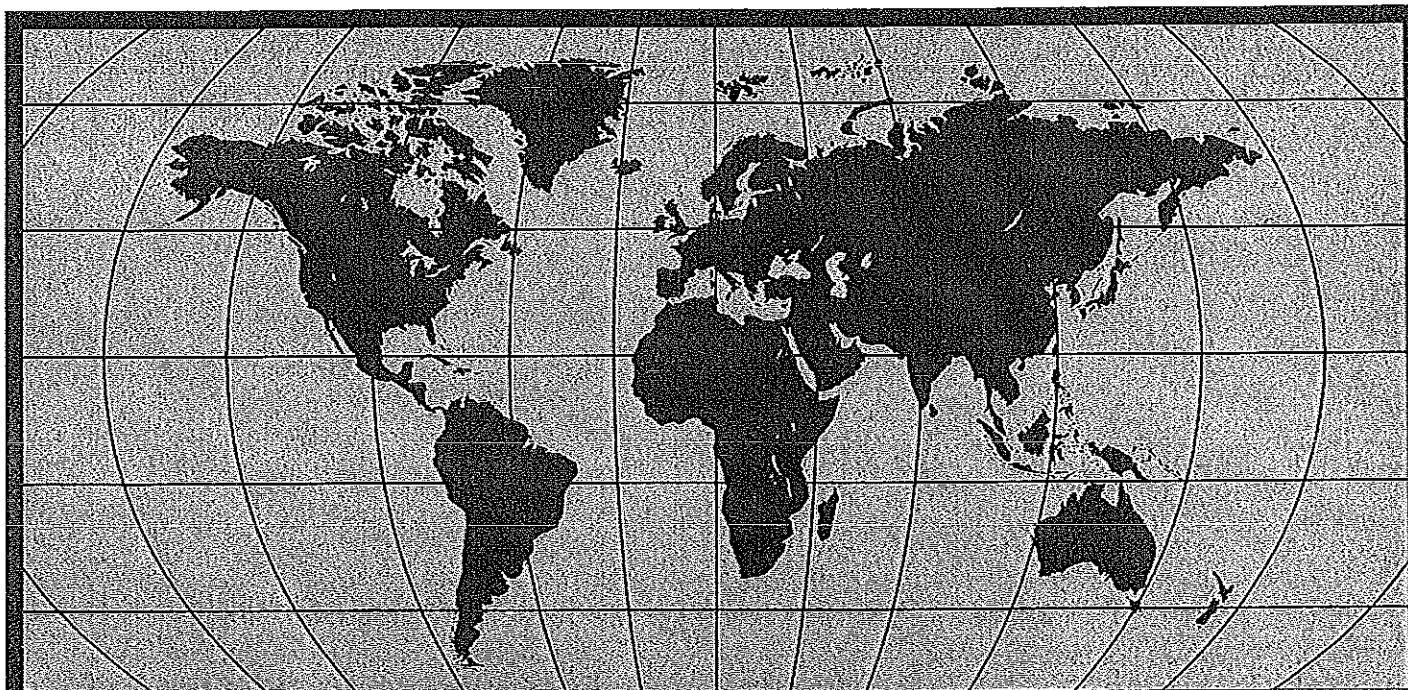


Valerie Ughetta
Director, Automotive Fuels
Auto Alliance

cc: Bill Striejewski, NV Department of Agriculture

Enclosures

Worldwide Fuel Charter (4th ed.)
Examples of Current Vehicle Owner's manual language
Proposed regulatory amendments
Sample label



Fourth Edition

WORLDWIDE FUEL CHARTER

SEPTEMBER 2006



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Worldwide Fuel Charter, Fourth Edition, September 2006

Errata Sheet

Page ii: Please add to the list of Associate Members:

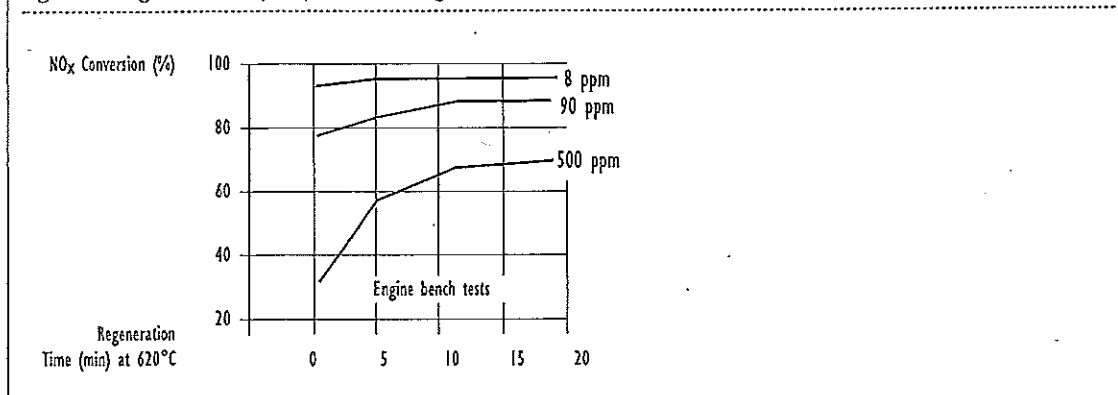
- > Society of Indian Automobile Manufacturers (SIAM)

Page 21, first paragraph, 5th sentence, should read:

“Figure 10 provides visual evidence of MMT’s impact on parts used in Tier 1 or LEV vehicles; the spark plug and oxygen sensor came from vehicles used in the 2002 joint automaker study, and the catalytic converters came from market vehicles, one driven in Canada and the other driven in California.”

Lean NO_x adsorber catalysts function by trapping NO_x chemically during lean burning conditions. NO_x can then be released and destroyed over a catalyst by a few seconds of rich operation. However, sulphur oxides are more strongly trapped, and as a competitor to NO_x, they reduce the NO_x capacity of the adsorber. Sulphur removal requires a more prolonged rich operating condition, but the original efficiency level can never be fully recovered. Also, allowing any rich operation significantly negates the fuel efficiency benefits of the lean burn engine technologies used with these catalysts. Sulphur-free gasolines, however, will maintain the necessary NO_x conversion efficiency (Figure 8). Sulphur-free gasoline is therefore necessary to maximise the benefits of lean-burn, fuel-efficient technology.

Figure 8: Regeneration of Sulphur Poisoning



ASH-FORMING (METAL-CONTAINING) ADDITIVES

Today's vehicles employ sophisticated emission control equipment such as three-way catalysts and exhaust gas oxygen sensors to provide precise closed-loop control. These systems must be kept in optimal condition to maintain low emissions for the lifetime of the vehicle. Ash-forming additives can adversely affect the operation of catalysts and other components, such as oxygen sensors, in an irreversible way that increases emissions. Thus, high-quality gasoline should be used and ash-forming additives must be avoided.

Lead

Lead alkyl additives have been used historically as inexpensive octane enhancers for gasoline. Concerns over health effects associated with the use of these additives, and the need for unleaded gasoline to support vehicle emission control technologies such as catalytic converters and oxygen sensors, have resulted in the elimination of leaded gasoline from many markets. As vehicle catalyst efficiencies have improved, tolerance to lead contamination is very low, so that even slight lead contamination can poison a catalyst. As catalyst-equipped vehicles are introduced into developing areas, unleaded gasoline must be available. Removal of lead compounds from gasoline reduces vehicle hydrocarbon emissions, even from vehicles without catalytic converters. A lead-free market worldwide is therefore essential, not only for emission control compatibility, but also because of the well-known adverse health effects of lead. Leaded gasoline should be eliminated as soon as possible.

Manganese (MMT)

MMT (methylcyclopentadienyl manganese tricarbonyl) is a manganese-based compound marketed as an octane-enhancing fuel additive for gasoline. It has also been suggested for use in diesel fuel as a smoke reducing additive.

Studies have shown that only a small percentage of the MMT-derived manganese from the fuel is emitted from the tailpipe – the majority remains within the engine, catalyst and exhaust system.

- The combustion products of MMT coat internal engine components such as spark plugs, potentially causing misfire which leads to increased emissions, increased fuel consumption and poor engine performance. These conditions result in increased owner dissatisfaction and expense for consumers and vehicle manufacturers.

- The combustion products of MMT also accumulate on the catalyst. In some cases, the front face of the catalyst can become plugged with deposits, causing poor vehicle operation and increased fuel consumption in addition to reduced emission control.

In 2002, automobile manufacturers jointly completed a multi-year study of the impact of MMT on Low Emission Vehicles (LEVs). At 100,000 miles (Figure 9), MMT significantly increased non-methane organic gases (NMOG), CO and NO_x emissions from the fleet. MMT also significantly decreased EPA City fuel economy, and on-road fuel economy through 100,000 miles was, on average, about 0.5 miles per gallon (mpg) lower. In another part of the study with earlier model vehicles equipped with Tier 1 emission control technology, HC emissions also increased through 50,000 miles. Figure 10 provides visual evidence of MMT's impact that was obtained from the LEV vehicles used in this study. The reddish-brown deposits have been identified as oxidized manganese.

Figure 9: Emission and Fuel Economy Effect of MMT – 1998-99 LEVs

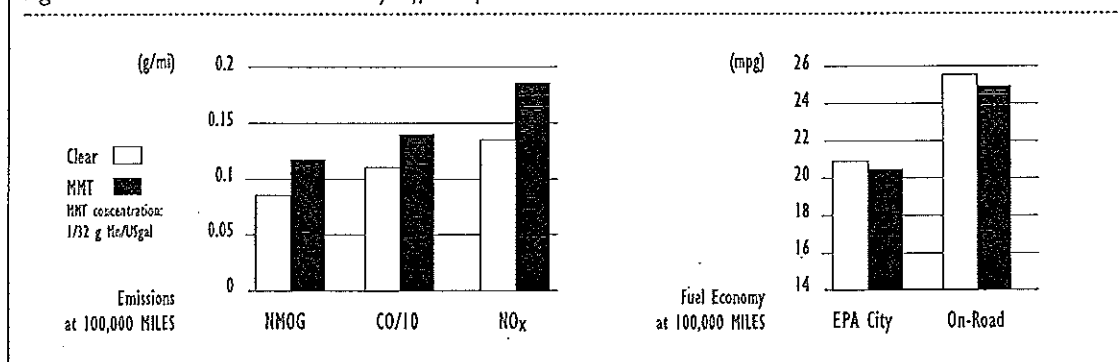
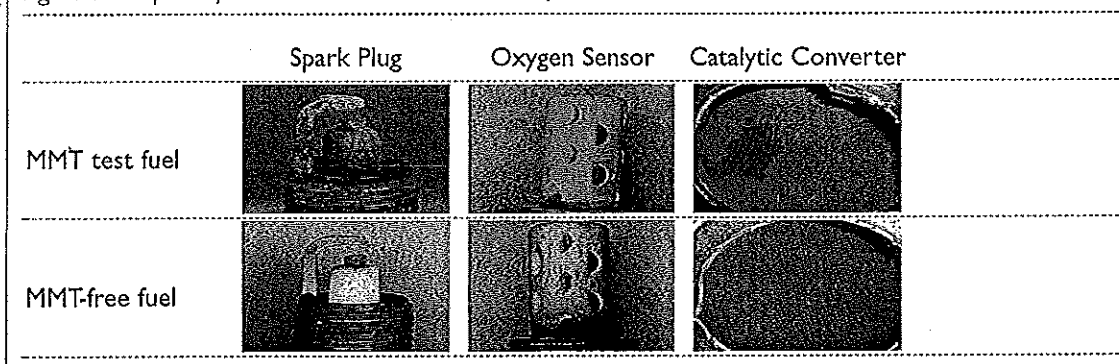


Figure 10: Impact of MMT on Tier 1/LEV Parts at 50,000 miles



Given this body of information, automobile manufacturers are extremely concerned with MMT's impact on the highly sensitive technologies that will be required to meet Tier-2 emission standards in the U.S. and Canada.

Many countries have been debating whether to allow the use of this gasoline additive while the real-world evidence of adverse impacts continues to grow. PSA and VW have reported on failed emission components in China and Argentina. Emission component failures, including catalyst plugging on advanced low emission vehicles, also have been reported in Canada where MMT was used in most of the gasoline until 2005, when most oil companies voluntarily stopped using it. South African vehicles, which have less advanced control systems than in Canada but use fuel with higher levels of MMT, also have been adversely affected (Figure 11). In spite of its approval for use in non-reformulated gasoline in the U.S. since 1995, it is used in very few gasolines sold in the U.S. Most major auto manufacturers state in their Owner Guides that they recommend against the use of MMT, advising further that any damage caused by MMT may not be covered by the warranty.

Figure 11: Evidence of MMT's Impact on Canadian and South African Vehicles



A: Canada

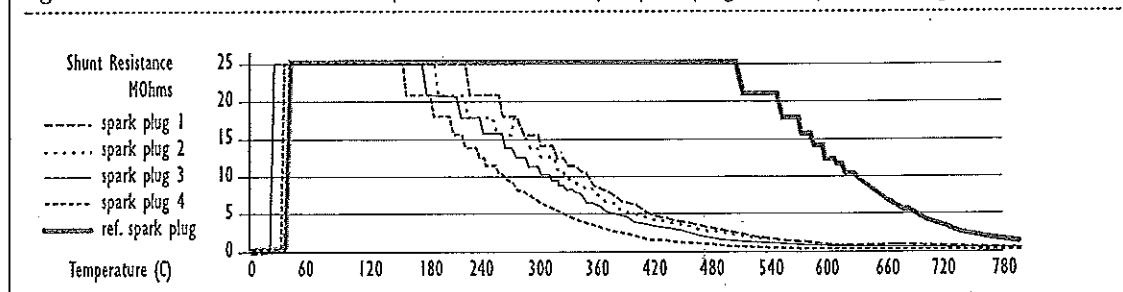
B: South Africa

Iron (Ferrocene)

Ferrocene has been used to replace lead as an octane enhancer for unleaded fuels in some markets. It contains iron, which deposits on spark plugs, catalysts and other exhaust system parts as iron oxide, and may also affect other engine components. The deposits will cause premature failure of the spark plugs, with plug life being reduced by up to 90% compared to normal service expectations. Failing spark plugs will short-circuit and cause misfiring when hot, such as under high load condition. This may cause thermal damage to the exhaust catalyst.

Figure 12 shows the reduction in spark plug insulator resistance as a function of temperature. The results compare plugs using fuel with a ferrocene additive after only 32 hours of testing, with a reference plug using conventional gasoline after 300 hours of testing.

Figure 12: Insulator resistance at temperature test results for spark plugs taken from test engine after 32 hours



Iron oxide also acts as a physical barrier between the catalyst/oxygen sensor and the exhaust gases, and also leads to erosion and plugging of the catalyst. As a result the emission control system is not able to function as designed, causing emissions to increase. Additionally, premature wear of critical engine components such as the pistons and rings can occur due to the presence of iron oxide in the vehicle lubrication system.

SILICON

Silicon is not a natural component of gasoline. However, in several instances silicon has appeared in commercial gasolines, usually as a result of waste solvents containing silicon compounds being used as a gasoline-blending component after the fuel has left the refinery. Such contamination has significant adverse effects on emission control systems. Silicon, even in low concentrations, can cause failure of oxygen sensors and high levels of deposits in engines and catalytic converters. This can lead to catastrophic engine failures in less than one tankful of contaminated fuel. Therefore, no detectable level of silicon should exist in gasoline nor should it be used as a component of any fuel additive package to improve gasoline and engine performance.

CHAPTER 590 - MOTOR VEHICLE FUEL, PETROLEUM PRODUCTS AND ANTIFREEZE

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- 590.010 Adoption by reference of specifications for antifreeze; additional specifications.
- 590.015 Inspection fee.
- 590.020 Prohibited acts.
- 590.030 Adoption by reference of standards for prediluted antifreeze.
- 590.035 Availability of Volume 15.05, "Engine Coolants," of *2001 Annual Book of ASTM Standards*.

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- 590.041 "Gallon" defined.
- 590.045 Availability of Volumes 05.01 and 05.02, "Petroleum Products and Lubricants," of *2002 Annual Book of ASTM Standards*.
- 590.050 Diesel fuel: Adoption by reference of specifications; posting of grade for diesel fuel oil.
- 590.051 Biodiesel and diesel fuel: Adoption by reference of standards; requirements for certain biodiesel fuel blends.
- 590.052 M-85 fuel methanol: Adoption by reference of specifications.
- 590.053 E-85 fuel methanol: Adoption by reference of specifications.
- 590.054 Hydrogen: Adoption by reference of specifications; restrictions on hydrogen sold or supplied in State.
- 590.055 Aviation fuel: Adoption by reference of specifications.
- 590.061 Gasoline: Adoption by reference of antiknock index for testing octane rating; determination of octane rating number; proof of transfer of fuel.
- 590.063 Gasoline: Posting of octane rating number on pump or other device; required accuracy of rating number.
- 590.065 Gasoline: Adoption by reference of specifications; limitations on vapor pressure; minimum temperatures for vapor lock; limitations on contents.
- 590.066 Gasoline: Request for variance from compliance with motor vehicle fuel standards.
- 590.070 Administrative penalties for sale of nonconforming fuel.

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- 590.120 "Board" defined.
- 590.130 "Building" defined.
- 590.140 "Container" defined.
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- 590.240 Fees; reduction in certain fees for holder of multiple classifications at same location.
- 590.241 Payment of charges billed to licensee by Board; resolution of disputed charges.
- 590.243 Period of validity of license.
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- 590.250 Plans required to be submitted with application for class 1, 2, 4 or 5 license; approval of plans.
- 590.253 Qualified persons: Connection with or employment by licensee or applicant required for issuance or renewal of certain licenses; performance of safety sensitive functions.
- 590.260 Residence.
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- 590.280 Holder of class 1A, 1B or 2A license: Disclosure of information; notification of new customer by licensee.

590.290 Holder of class 1 or class 2 license: Provision of certain information and notice; response to certain requests.

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590.315 Certificate of competency: Application; reexamination without additional fee; additional certificate of competency without additional fee.

590.320 Certificate of competency: Examination of applicant or holder; waiver of examination.

590.340 Certificate of competency: Issuance.

590.350 Certificate of competency: Expiration.

590.360 Certificate of competency: Renewal.

590.365 Certificate of competency: Approval of courses for continuing education.

590.380 Certificate of competency: Lapse; suspension; revocation; reapplication.

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590.452 Installation and modification of LP gas equipment.

590.454 Installation for dispensing LP gas.

590.456 Installation of cabinet for LP gas cylinder exchange.

590.460 Installation of tanks.

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590.500 Transfer of gas.

590.520 Reports of accidents.

590.530 Condemnation of installations.

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590.657 Procedure following investigation of informal complaint; notice of hearing and formal complaint; answer.

590.660 Joining of formal complaints.

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590.680 Hearings: Appearance and representation of parties.

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590.760 Discharges: Duties of operators.

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590.774 Factors considered in determining necessity for cleanup of discharge from certain storage tanks.

590.780 Form of claim for reimbursement; time limitations for filing claims for reimbursement; payment to operator, vendor or contractor; payment required of operator; payment of per diem allowance and travel expenses.

590.790 Severability of provisions.

FEE FOR CERTAIN FUELS AND HEATING OIL

590.800 Payment by dealers and suppliers.

590.810 Provision of refund or credit for exportation.

FUELS

NAC 590.041 "Gallon" defined. (NRS 590.070) As used in NAC 590.041 to 590.070, inclusive, unless the context otherwise requires, "gallon" means 231 cubic inches.

(Added to NAC by Dep't of Agriculture, eff. 3-27-92; A by Bd. of Agriculture, 11-18-93; R145-98, 12-14-98; R064-01, 12-17-2001; R010-09, 10-27-2009)

NAC 590.045 Availability of Volumes 05.01 and 05.02, "Petroleum Products and Lubricants," of 2002 Annual Book of ASTM Standards. (NRS 590.070, 590.073, 590.100)

1. Volumes 05.01 and 05.02, "Petroleum Products and Lubricants," of the 2002 *Annual Book of ASTM Standards*, are available for inspection at the office of the State Department of Agriculture, 350 Capitol Hill Avenue, Reno, Nevada 89502, and 2300 McLeod Street, Las Vegas, Nevada 89104.

2. The volumes may be purchased at a cost of \$361 from ASTM International, 100 Barr Harbor Drive, West Conshohocken, Pennsylvania 19428.

(Added to NAC by St. Sealer of Weights & Measures, eff. 3-5-90; A by Dep't of Agriculture, 3-27-92; A by St. Sealer of Weights & Measures, 11-18-93; A by Bd. of Agriculture, 8-9-94; R145-98, 12-14-98; A by St. Sealer of Weights & Measures by R149-98, 12-14-98; A by Bd. of Agriculture by R176-01, 5-31-2002)

NAC 590.061 Gasoline: Adoption by reference of antiknock index for testing octane rating; determination of octane rating number; proof of transfer of fuel. (NRS 590.070, 590.100)

1. The State Board of Agriculture hereby adopts by reference the antiknock index for testing the octane rating of gasoline that is defined in Volume 05.02, "Petroleum Products and Lubricants," of the 2002 *Annual Book of ASTM Standards*, ASTM designation D4814-01a.

2. Gasoline that is brought into this State for delivery to a person in this State must have an octane rating number which is determined by the antiknock index method described in subsection 1.

3. A person who transfers fuel to a person in this State, other than the consumer of the fuel, shall provide a proof of transfer to the person receiving the fuel. The proof of transfer must be:

- (a) A delivery ticket;
 - (b) An invoice;
 - (c) A bill of lading;
 - (d) A bill of sale;
 - (e) A terminal ticket; or
 - (f) Any other proof of transfer that is approved by the State Board of Agriculture.
4. The proof of transfer must contain:
- (a) The name of the person making the transfer;
 - (b) The name of the person to whom the fuel is transferred;
 - (c) The date of the transfer; and
 - (d) If the fuel is gasoline, the octane rating number of the gasoline.
 - (e) If the fuel is gasoline, an express statement whether it contains manganese or MMT (Methylcyclopentadienyl Manganese Tricarbonyl).
5. The person receiving the fuel must keep a copy of the proof of transfer at the location at which the fuel was received for not less than 30 days after the date of the delivery of the fuel. After that period, the proof of transfer must be retained at any location for not less than 1 year after the date of the delivery of the fuel and be made available to the State Department of Agriculture upon request.
6. Any other test method may be used if the State Sealer of Weights and Measures determines that another method produces results equivalent to the results of the specified method. A method approved by ASTM International that has not yet been published shall be deemed to meet the appropriate criteria.
- (Added to NAC by St. Sealer of Weights & Measures, eff. 10-23-91; A 11-18-93; A by Bd. of Agriculture by R145-98, 12-14-98; R176-01, 5-31-2002)

NAC 590.063 Gasoline: Posting of octane rating number on pump or other device; required accuracy of rating number. (NRS 590.070, 590.100)

- 1. The octane rating number of the gasoline from the proof of transfer must be posted on the pump or other device for dispensing the gasoline.
 - 2. The octane rating number of the product that is in the pump or other device for dispensing gasoline must not be lower than the octane rating that is posted on the pump or device.
- (Added to NAC by St. Sealer of Weights & Measures, eff. 10-23-91; A by Bd. of Agriculture, 2-20-96)

NAC 590.065 Gasoline: Adoption by reference of specifications; limitations on vapor pressure; minimum temperatures for vapor lock; limitations on contents. (NRS 561.105, 590.070)

- 1. Except as otherwise provided in this section, the State Board of Agriculture hereby adopts by reference ASTM D4814, "Standard Specification for Automotive Spark-Ignition Engine Fuel," contained in Volume 05.02, "Petroleum Products and Lubricants," of the *2009 Annual Book of ASTM Standards*, as that standard existed on July 1, 2009, and any subsequent revision of that standard published by ASTM International that is approved by the State Board of Agriculture pursuant to this section for use in this State. The standard may be purchased from ASTM International, 100 Barr Harbor Drive, West Conshohocken, Pennsylvania 19428-2959, or at the Internet address <http://www.astm.org>, for the price of \$53.
- 2. The State Board of Agriculture will review each revision of ASTM D4814 that is published after July 1, 2009, to ensure its suitability for use in this State. If the State Board of Agriculture

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fails to approve or disapprove such a revision within 120 days after its date of publication, the revision shall be deemed approved by the State Board of Agriculture for use in this State. The State Board of Agriculture will file a copy of each revision which it approves or which is deemed approved pursuant to this section with the Secretary of State and the State Library and Archives Administrator. The most recent revision that is approved by the State Board of Agriculture will be available for inspection at the State Department of Agriculture, 405 South 21st Street, Sparks, Nevada 89431.

3. Notwithstanding the provisions of Table 4 ("Schedule of Seasonal and Geographical Volatility Classes") of ASTM D4814 that apply to this State, the schedule that is designated in Table 4 for the area of this State that lies north of the 38th degree of north latitude applies to the entire area of this State unless the United States Environmental Protection Agency requires a county to comply with a different requirement relating to vapor pressure.

4. Except as otherwise provided in subsection 6, gasoline:

(a) Sold between June 1 and September 15 of each calendar year containing:

(1) Not less than 9 percent ethanol by volume and not more than 10 percent ethanol by volume must not exceed the limits for vapor pressure set forth in ASTM D4814 by more than 1 pound per square inch.

(2) Less than 9 percent ethanol by volume must not exceed the limits specified in ASTM D4814.

(b) Sold during any other period in a calendar year containing not more than 10 percent ethanol by volume must not exceed the limits specified in ASTM D4814 by more than 1 pound per square inch.

5. Until May 1, 2012, or until ASTM D4814 is amended to incorporate changes to the minimum temperature for vapor lock for the following classes to include the effects of volatility of not more than 10 percent of ethanol by volume, whichever occurs first, the minimum temperature for a vapor-liquid ratio of 20 for the applicable class of vapor lock protection for a blend of gasoline and ethanol is:

(a) For class 1, 54 degrees Centigrade (129 degrees Fahrenheit).

(b) For class 2, 50 degrees Centigrade (122 degrees Fahrenheit).

(c) For class 3, 47 degrees Centigrade (116 degrees Fahrenheit).

(d) For class 4, 41.5 degrees Centigrade (107 degrees Fahrenheit).

(e) For class 5, 39 degrees Centigrade (102 degrees Fahrenheit).

(f) For class 6, 35 degrees Centigrade (95 degrees Fahrenheit).

→ Gasoline and any blend of gasoline and ethanol that is sold in the area of this State which is east of the 117th degree of west longitude and north of the 38th degree of north latitude must meet the minimum temperatures for vapor lock protection set forth in ASTM D4814.

6. Gasoline and any blend of gasoline and ethanol sold in Clark County between October 1 and the following March 31 must not exceed a vapor pressure of 13.5 pounds per square inch.

7. A person shall not sell, offer for sale, supply or offer to supply in this State any gasoline intended for use in a vehicle which is primarily driven on a highway if:

(a) It contains more than 0.05 gram of lead per gallon;

(b) It contains more than 0.005 gram of phosphorus per gallon;

(c) It contains more than 10 percent ethanol by volume; or

(d) It contains more than 95 parts per million of sulfur.

8. Any pump dispensing gasoline which contains a manganese or MMT, as stated in the transfer documents required in NAC 590.061(4)(e), for sale to the consumer must be affixed with a label

(minimum 4" x 4", yellow background) as prescribed by the Department which includes the following information:

- (a) Attention: Read before you pump
- (b) Gasoline sold here may contain manganese or MMT
- (c) Some automakers recommend against using fuel containing manganese or MMT
- (d) Resulting damage may not be covered by warranty
- (e) Check your owner's manual before fueling

The label shall be affixed to any pump dispensing gasoline delivered within the previous six (6) months which contained manganese or MMT as noted on the transfer documents pursuant to NAC 590.061(4)(e).

810. Any other test method may be used if the State Sealer of Weights and Measures determines that another method produces results equivalent to the results of the specified method. A method approved by ASTM International that has not yet been published shall be deemed to meet the appropriate criteria.

(Added to NAC by Bd. of Agriculture, eff. 3-5-90; A by Dep't of Agriculture, 3-27-92; A by Bd. of Agriculture, 11-18-93; 11-2-94; 2-20-96; 10-22-97; R145-98, 12-14-98; R176-01, 5-31-2002; R002-04, 9-21-2004; R111-08, 1-28-2010; R032-10, 6-30-2010)

NAC 590.066 Gasoline: Request for variance from compliance with motor vehicle fuel standards. (NRS 590.070)

1. Except as otherwise provided in subsection 6, a supplier may submit a request to the Director of the State Department of Agriculture or the Director's designee for a variance of not more than 30 days to supply motor vehicle fuel that does not meet the standards set forth in NAC 590.065 if the supplier demonstrates that a disruption in supply exists or is imminent.

2. If a supplier requests a variance pursuant to subsection 1, the supplier shall provide the following information in writing to the Director or the Director's designee:

- (a) The specific supply conditions that may result in a shortage of motor vehicle fuel, without disclosing any proprietary information of the supplier;
- (b) The specific geographic area to which the variance will apply;
- (c) The period for which the variance will be in effect; and
- (d) The type of motor vehicle fuel proposed for distribution or sale.

3. The Director or the Director's designee shall notify:

(a) The supplier in writing within 24 hours after receipt of the request for a variance as to whether the request is granted, unless otherwise agreed upon by both parties. Approval of a variance must be based on information which demonstrates that a disruption in supply exists or is imminent, and such approval is applicable to all suppliers within the specified geographic area for the approved period.

(b) The Motor Carrier Division of the Department of Motor Vehicles and other interested parties of any variance granted by the State Department of Agriculture. A list of interested parties must be kept on file by the State Department of Agriculture.

4. The Director or the Director's designee may authorize an extension of a variance approved pursuant to this section, not to exceed 30 days, if the supplier demonstrates in writing that the conditions identified in the initial request continue to exist.

5. Except as otherwise provided in NRS 239.010, the Director or the Director's designee shall keep confidential any proprietary or competitively sensitive information specific to the supplier which the Director or the Director's designee acquires during the process of granting or denying

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a variance pursuant to this section and shall not disclose the information to the public or any other state agency or entity.

6. A variance may not be granted pursuant to this section if the motor vehicle fuel is to be sold in a geographic area for which fuel specifications are prescribed in the State Implementation Plan.

7. Approval of a variance by the Director or the Director's designee does not waive the reporting requirements or any applicable taxes and fees pursuant to chapters 360A, 365, 366, 373 and 590 of NRS.

8. As used in this section:

(a) "Disruption in supply" means an unusual condition, either natural or man-made, that may impede the production, transportation, distribution or sale of motor vehicle fuel which meets the standards set forth in NAC 590.065 in sufficient quantity to meet sustainable demands.

(b) "State Implementation Plan" has the meaning ascribed to it in NAC 486A.125.

(c) "Supplier" has the meaning ascribed to it in NRS 365.084.

(Added to NAC by Bd. of Agriculture by R010-09, eff. 10-27-2009)

NAC 590.070 Administrative penalties for sale of nonconforming fuel. (NRS 590.071)

For any violation of the provisions of NRS 590.070, including any violation of standards relating to diesel fuel, the failure to maintain proper records, or the failure to properly label pumps, the State Board of Agriculture may:

1. For the first violation, issue a written warning, impose a fine of not more than \$2,000 for each day the violation continues, or issue a warning and impose a fine.

2. For the second violation, impose a fine of not more than \$3,500 for each day the violation continues.

3. For the third or subsequent violation, impose a fine of not more than \$5,000 for each day the violation continues.

(Added to NAC by Bd. of Agriculture, eff. 3-5-90; A 11-2-92)

ATTENTION

**READ
BEFORE
YOU
PUMP!**

Check Your Owner's Manual Before Fueling!

- Gasoline sold here may contain manganese or MMT
- Some automakers recommend against using fuel containing manganese or MMT
- Resulting damage may not be covered by warranty

Sample Owner's Manual Language for Manganese or MMT

Chrysler: 2012 language used in all Chrysler/Dodge/Jeep models

MMT in Gasoline

MMT is a manganese containing metallic additive that is blended into some gasoline to increase octane. Gasoline blended with MMT provides no performance advantage beyond gasoline of the same octane number without MMT. Gasoline blended with MMT reduces spark plug life and reduces emission system performance in some vehicles. The manufacturer recommends that gasoline without MMT be used in your vehicle. The MMT content of gasoline may not be indicated on the gasoline pump; therefore, you should ask your gasoline retailer whether or not his/her gasoline contains MMT. It is even more important to look for gasolines without MMT in Canada, because MMT can be used at levels higher than those allowed in the United States. MMT is prohibited in Federal and California reformulated gasoline.

Ford: 2012 Ford Fusion; same language used in all owner's manuals

Your vehicle was not designed to use fuel or fuel additives with metallic compounds, including manganese-based additives.

Note: Use of any fuel other than those recommended may cause powertrain damage, a loss of vehicle performance, and repairs may not be covered under warranty.

General Motors: 2012 Cadillac CTS; same language used in all owner's manuals

Some gasolines that are not reformulated for low emissions can contain an octane-enhancing additive called methylcyclopentadienyl manganese tricarbonyl (MMT); ask the attendant where you buy gasoline whether the fuel contains MMT. WE recommend against the use of such gasolines. Fuel containing MMT can reduce spark plug life and affect emission control system performance. The malfunction indicator lamp might turn on. If this occurs, return to your dealer for service.

Honda: 2012 language in all Honda/Acura models

Some gasoline in North America contains MMT, a manganese-based fuel additive. Prolonged and consistent use of gasoline containing MMT can deteriorate your vehicle's performance, fuel economy, and the emissions control system. Always use MMT-free gasoline if alternatives exist. Failures caused by use of gasoline containing MMT may not be covered under warranty.

Subaru: 2013 Subaru Forester; same language used in all owner's manuals

MMT

Some gasoline contains an octane-enhancing additive called MMT (Methylcyclopentadienyl Manganese Tricarbonyl). If you use such fuels, your emission control system performance may deteriorate and the CHECK ENGINE warning light/Malfunction indicator light may turn on. If this

happens, contact an authorized SUBARU dealer for service. If it is determined that the condition is caused by the type of fuel used, repairs may not be covered by your warranty.

Toyota: 2012 language in all Toyota/Scion/Lexus models

Non-recommendation of the use of gasoline containing MMT

Some gasoline contains an octane-enhancing additive called MMT (Methylcyclopentadienyl Manganese Tricarbonyl).

Toyota does not recommend the use of gasoline that contains MMT. If fuel containing MMT is used, your emission control system may be adversely affected.

The malfunction indicator lamp on the instrument cluster may come on. If this happens, contact you Toyota dealer for service.

David Michael Jones

From: John Cabaniss [jcabaniss@globalautomakers.org]
Sent: Monday, December 03, 2012 1:13 PM
To: David Michael Jones
Cc: Alfredo Alonso; Valerie Ughetta (Alliance); Brillhart, Ember (Honda); William S. Striejewski; Jeff Jetter; Michael Hillerby; Julia Rege; John Cabaniss
Subject: Additional Information regarding MMT usage; European report
Importance: High
Attachments: 091116 ACEA MMT.pdf

Dear Mr. Jones,

At the public workshop on November 13, 2012, Mr. Alonso mentioned some activity and a report on MMT in Europe. On his behalf, I am forwarding a copy of the ACEA report entitled **ACEA Position on Metal Based Fuel Additives**. A summary of the European activity on MMT can be found at <http://www.theicct.org/blogs/staff/update-mmt>

Finally, the EU Court of Justice decision can be found <http://curia.europa.eu/juris/liste.jsf?language=en&jur=C,T,F&num=C-343/09&td=ALL>

Let m know if I can provide any further information.

Regards.

John Cabaniss

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GlobalAutomakers





ACEA

ACEA Position on Metal Based Fuel Additives

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1. Background:

In late 2008, during the later stages of the political discussions on Directive 2009/30/EC¹ (hereafter "fuels directive") a ban of the use of methylcyclopentadienyl manganese tricarbonyl with the formula $(\text{CH}_3\text{C}_5\text{H}_4)\text{Mn}(\text{CO})_3$ (hereafter "MMT"²) was under consideration. However, due to outside pressures, the European Commission proposed a compromise text, limiting the permissible manganese content in fuels and containing a requirement to label the sale of fuels 'containing metallic additives'. The European Parliament and Council accepted the Commission's compromise text.

Article 8a of the fuels directive:

- Requires the European Commission to conduct, by 31st December 2012, an assessment of the risk to health and environment of the use of metallic additives in fuel and, for this purpose, to develop a test methodology;
- Pending the development of the test methodology and the Commission's assessment, the presence of MMT in fuels will be limited to 6mg of manganese per litre (hereafter Mn/l) from when the fuels directive enters into force across the EU, i.e. from 1st January 2011, when Member States will have had to transpose the directive into their national laws;
- The limit shall be 2mg Mn/l from 1st January 2014 and this limit shall be revised on the basis of the results of the Commission's assessment using the developed test methodology. The limit may be reduced to zero, if the Commission's risk assessment justifies it.
- Member States shall ensure that where fuels containing metallic additives are made available to customers, a label is displayed saying "*contains metallic additives*".

It is understood that if the assessment is not completed, the limit of 2mg Mn/l will apply from 1st January 2014.

Now, Afton Chemical Corporation, hereafter "Afton", (which succeeded the Ethyl Corporation in 2004 and is producing MMT exclusively) addressed several questions concerning the lawfulness of the fuels directive to the UK High Court of Justice. The High Court transferred Afton's questions to the Court of Justice of the European Communities (hereafter "ECJ") because The High Court recognises that only the ECJ has jurisdiction to declare invalid a provision of a Directive³. The High Court considers that the ECJ should grant this case priority status given that the deadline for transposing the fuels directive by the Member States is 31st December 2010 and thereby requests a preliminary ruling by the ECJ.

Afton submits that the inclusion of the new Article 8a(2) in Directive 98/70/EC, imposing limits on the use of MMT, is unlawful in that it was enacted as a result of a manifest error of assessment, it unjustifiably contradicts the carefully evidenced conclusions of the Commission of the European Communities in its proposal for an amending directive, it was enacted in circumstances in which the requirements of the precautionary principle were not met and it violates the well-established Community law principles of proportionality, equal treatment and legal certainty. Afton further submits that the Directive's inclusion of the new Articles 8a(4), 8a(5) and 8(a)(6) in Directive 98/70/EC, imposing a Labelling Requirement, is unlawful, it is the result of a manifest error of assessment and breaches the principle of proportionality.

¹ Official Journal of the European Union L140, 5.6.2009, page 88.

² The trademark MMT® is owned by an Afton group company.

³ ECJ registration No. 827588 on August 27th ECJ preliminary reference C-342/09 (29/09/09)

A preliminary ruling of the ECJ is requested accordingly on the following questions:

In relation to the provisions relating to metallic additives in Directive 2009/30/EC of the European Parliament and of the Council amending Directive 98/70/EC as regards the specification of petrol, diesel and gasoil and introducing a mechanism to monitor and reduce greenhouse gas emissions from the use of road transport fuels and amending Council Directive 1999/32/EC as regards the specification of fuel used by inland waterway vessels and repealing Directive 93/12/EEC ("the Directive"):

1. *With reference to that part of Article 1(8) which inserts a new Article 8(a)(2) into Directive 98/70 limiting the use of MMT in fuel to 6 mg Mn per litre from 1 January 2011 and to 2 mg from 1 January 2014, is the imposition of such limits:*
 - (1) *Unlawful as being based on a manifest error of assessment?*
 - (2) *Unlawful as being in violation of the requirements of the precautionary principle?*
 - (3) *Unlawful as lacking in proportionality?*
 - (4) *Unlawful as being contrary to the principle of equal treatment?*
 - (5) *Unlawful as being contrary to the principle of legal certainty?*
2. *With reference to that part of Article 1(8) which inserts a new Article 8(a)(4), Article 8(a)(5) and 8(a)(6) into Directive 98/70 requiring the labelling of all fuels which contain metallic additives with the phrase "contains metallic additives", is the imposition of such a labelling requirement:*
 - (1) *Unlawful as being based on a manifest error of assessment?*
 - (2) *Unlawful as lacking in proportionality?*

The parties in the case before the national court, the Member States, the Commission and, where appropriate, the European Parliament, the Council [and the European Central Bank] are entitled to submit written observations to the ECJ on the requests for preliminary ruling within two months of the notification. Further, other than the Member States, which are parties to the Agreement on the European Economic Area, as well as the EFTA Surveillance Authority, may, within two months of notification, where one of the fields of application of that Agreement is concerned, submit written observations.

Therefore, the deadline for any submissions to the ECJ is **29th November 2009**.

2. Introduction

This paper is produced by the European motor vehicle manufacturing industry to submit information and test results on the different technical and health related consequences of the addition of manganese to motor vehicle fuels.

In addition, this document concludes with a recommendation of the motor vehicle manufacturers concerning the use of metal based additives in motor vehicle fuels.

With the increasing stringency of current and future emissions legislation world-wide, significantly more stringent in-use requirements and the new regulations for CO₂ reduction, the issue of fuel quality is of paramount importance.

One of the major concerns to the motor vehicle manufacturers are the risks posed by the use of metallic fuel additives, primarily as octane enhancers in gasoline.

It is possible that some members within the oil industry are contemplating the use of additives such as ferrocene (iron) and MMT. These substances have gained attention following the phase-out of lead in gasoline. While they may have a lesser immediate

impact on the proper operation of modern emission control systems than lead poisoning, experience shows that significant harmful effects are associated with the use of these additives over time.

Experience in other countries across the world suggests that the use of MMT is not compatible with current emission control and on-board diagnostic systems. Of even greater concern is the impact of metallic fuel additives on the new and emerging technologies, which are designed to satisfy more stringent future environmental legislation being introduced worldwide. To meet new laws, motor vehicle manufacturers are forced to use higher cell density catalysts (i.e. catalysts with ever smaller channels through which the exhaust gases flow – the greater number of smaller channels increases the active catalytic area within the catalyst). Such catalysts are mounted closer to the engine and they are exposed to higher temperatures. Such designs will be more sensitive to the fuel. When using fuels containing metallic additives, data shows that catalysts and other components within the emission control system are poisoned by deposits that also block the channels in the catalyst. As a result, in the future more customer vehicles will be affected by the use of metallic additives in fuels.

Today, health scientists are strongly opposed to the use of MMT. Combustion of MMT releases manganese, a potent neurotoxin when inhaled. Therefore, health scientists urge policy makers at all levels of government to adopt a position that is in the interest of public health and welfare.

Motor vehicle manufacturers are not against the use of all fuel additives and we actively encourage the use of anti-corrosion and detergent additives for proper operation of vehicles in service.

However, as well as MMT, motor vehicle manufacturers do not recommend, approve or permit the use of any metallic additive, including iron (Fe) or lead (Pb) - see section 5.1 that refers to the WWFC [WWFC, 2006].

3. Status of use of MMT

Afton states on its website⁴ that the "MMT fuel additive is approved and used in all regions of the world," but there is little publicly accessible data on the amount of MMT consumed worldwide.

It is easy to misinterpret the above statement to suggest that broad support for MMT exists throughout the world. It fails to distinguish between approving and allowing that reveals how actively a country supports it. An approval certifies that a fuel additive meets certain performance criteria, whereas allowing its use simply means there is not a sufficient basis to disallow it. The distinction is important in places like the United States and Canada where MMT is allowed, but not approved. In these places MMT is almost completely absent from market fuels. The best indicator of approval and actual use of MMT is its volumetric sales by country. Until Afton makes this information public in a verifiable way, there can be no certainty about how much support for the use of MMT truly exists [ICCT, 2009].

Here, reference is made to the ICCT⁵ Reports [ICCT, 2009 as update of ICCT, 2004]. In the following figure 3.1 and table 3.1 the current legal status of MMT is illustrated.

⁴ www.aftonchemical.com/Products/mmt/index.htm

⁵ The International Council on Clean Transportation ICCT (www.theicct.org) seeks to develop and pursue strategies in many countries to dramatically reduce pollution and energy waste from cars, trucks, buses, and other mobile sources. Jurisdictions represented in the ICCT currently include the European Union, Germany, Great Britain, Japan, China, India, Brazil, Mexico, Thailand, the United States, and California and its members participate as experts without officially representing their agencies or governments.

MMT Legal Status in Selected Countries, 2009

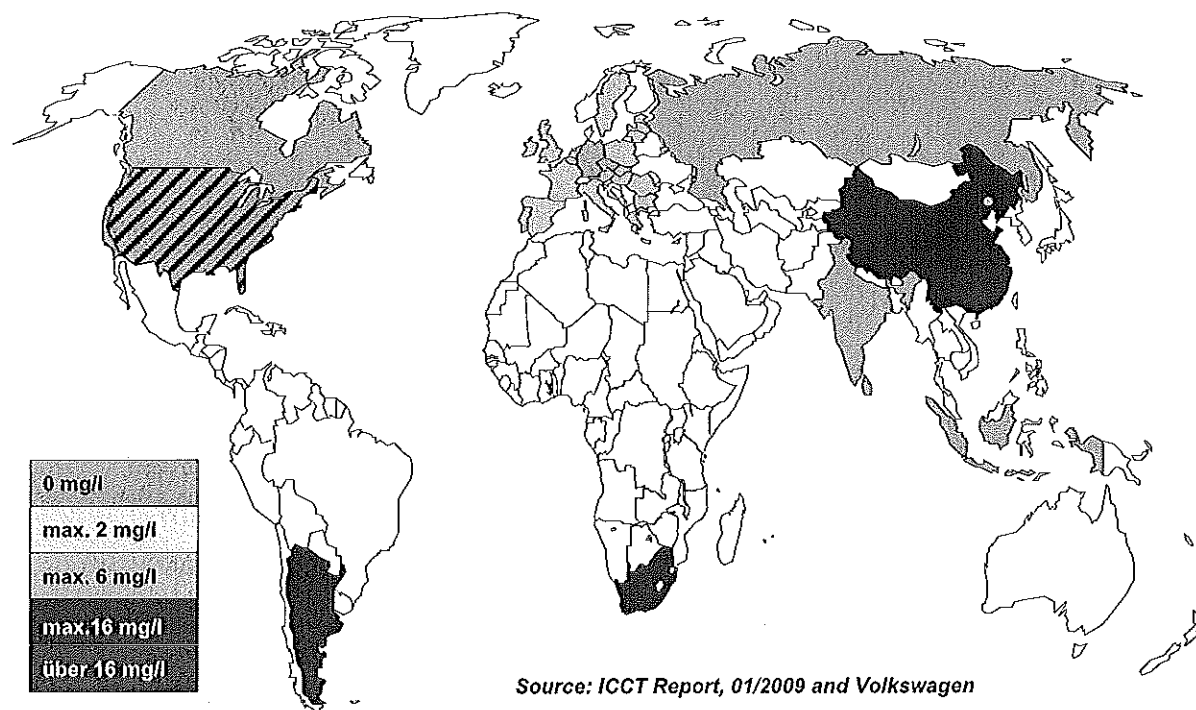


Figure 3.1: MMT Legal Status in Selected Countries

Table 3.1: MMT Legal Status in Selected Countries (Source: ICCT, 2009 and Volkswagen)

Country	Fuel	Mn maximum [mg/l]	Date enforced	Law or Regulation
Laws in Place:				
Germany	unleaded petrol	0		1971 Gasoline Lead Law
California	unleaded petrol	0	8/31/1977	Regulation 13 CCR 2254
United States	reformulated petrol	0	3/18/1994	40 CFR 80 Regulation of Fuels/ Fuel Additives
	non-reformulated petrol	8.3	7/11/1995	60 FR 36414
New Zealand	unleaded petrol	2	9/1/2002	2002 Petroleum Products Regulations
China (Beijing)	unleaded petrol	6	1/1/2008	n/a

ACEA considers this international network of government officials and experts actively engaged in setting policy for the control of air pollutant emissions from motor vehicles and transportation fuels as independent from the automotive and the oil industries.

China (National)	petrol	16	1/1/2006	GB17830-2006
Brazil	unleaded petrol	no limit- subject to EIA		n/a
Argentina	petrol	18		Resolucion 1283 / 2006
Czech Republic	petrol	0		ČSN EN 228
South Africa	metal-containing unleaded petrol (Labelling: LRP)	36		Government Gazette 23 Jun 2006 No. 28958
European Union	all	6	1/1/2011	Directive 2009/30/EC
	all	2	1/1/2014	Directive 2009/30/EC
Malta	Lead replacement petrol (Labelling: LRP)	?	22/01/2009	Technical Regulation No. 118
Russia	all	0		Technical Regulation No. 118
Voluntary Actions:				
United States	non-reformulated petrol	0	1/1/1995	
Canada	unleaded petrol	0	1/1/2004	
India	petrol	0	3/1/2006	
Indonesia	petrol	0		
Historical Laws:				
United States	unleaded petrol	0	1977-1995	1977 Amendments to the Clean Air Act
Canada	unleaded petrol	0	1997-1998	Bill C-29 Manganese-Based Fuel Additives Act

Detailed examples:

India:

In June 2005, the Union Petroleum Minister, Mani Shankar Aiyar ascertained the status of the use of MMT in India. This elicited a voluntary action by the oil companies to no longer use MMT.

In a written communiqué to the Centre for Science & Environment, the Union Petroleum Minister has affirmed:

"I appreciate the concerns raised by your organisation that MMT forms manganese particles when it burns as petrol additive, which can be a potent neurotoxin when inhaled and also damages the emission control system of vehicles. I also share your views that the health of the people of our country is of prime importance. Even if MMT is a low cost

octane enhancer, its use in petrol needs to be discontinued in the interest of the community.

In this context, I have got the reports from our oil PSUs. I have been informed that except for Numaligrah Refinery Ltd (NRL), which uses marginal quantities of MMT as a trimming agent for a marginal increase in the octane number of motor spirit, other public sector oil refineries are not using MMT any more. You will be glad to learn that NRL too will discontinue the use of MMT by March 2006 by when the new facilities being set up by them for producing motor spirit are expected to be completed."

Canada:

The concerns of vehicle manufacturers, together with those of environmentalists over the long-term exposure of the population to manganese, led to a ban on the importation and inter-provincial transport of MMT in Canada in April 1997.

On 15th April 1997, Ethyl Corporation submitted a claim under the UNCITRAL Rules on its own behalf to arbitration against Canada. Ethyl claimed that a Canadian statute banning imports of the gasoline additive MMT for use in unleaded gasoline breached Chapter Eleven's requirement of national treatment (Article 1102), prohibition of expropriation (Article 1110) and prohibition of performance requirements (Article 1106). A Canadian court subsequently found the act to be invalid under the Canadian law for trade reasons, and Canada and Ethyl settled the Chapter Eleven claim.

MMT was present in Canadian gasoline until its use was voluntarily stopped by Canadian refiners between 2003 and 2005. Although MMT use is banned in California and in the reformulated gasoline sold in many urban areas of the U.S, in Canada the addition of MMT to unleaded gasoline, generally at levels up to 18mg Mn/l, has been practiced continuously from the mid-1970s through the 2003 to 2005 phase-out period.

Since 2005, MMT has not been used in Canada.

USA:

The United States Environmental Protection Agency (EPA) was asked by the Ethyl Corporation to grant a waiver for MMT as an additive to be used in commercially available gasoline as an octane booster. EPA denied the waiver request a couple of times. Finally, in a lawsuit against EPA, a 1995 court decision required EPA to allow MMT in commercially available gasoline, with the exception of reformulated gasoline, because, in 1990, it was already banned by the U.S. Congress in an amendment to the Clean Air Act⁶.

Therefore MMT is still banned for being used in reformulated gasoline in California⁷ and in all US states.

⁶ THE U.S. CLEAN AIR ACT, Sec. 211, REGULATION OF FUELS: (k) REFORMULATED GASOLINE FOR CONVENTIONAL VEHICLES.

(D) HEAVY METALS.—The gasoline shall have no heavy metals, including lead or manganese. The Administrator may waive the prohibition contained in this subparagraph for a heavy metal (other than lead) if the Administrator determines that addition of the heavy metal to the gasoline will not increase, on an aggregate mass or cancer-risk basis, toxic air pollutant emissions from motor vehicles.

⁷ California Title 13, California Code of Regulations, § 2254. Manganese Additive Content.

(a) Except as provided in subparagraph (b), no person shall add manganese or any manganese compound, including the compound methylcyclopentadienyl manganese tricarbonyl (MMT), to gasoline represented as unleaded intended to be sold, offered for sale, or delivered for sale at retail in the State of California.

(b) The prohibitions set forth in subparagraph (a) shall not apply to any person who has applied for and received from the Executive Officer written approval to add manganese or any manganese compound, including MMT, to gasoline represented as unleaded for the purpose of conducting tests or research into

Since 2007 and on a voluntary basis, U.S. fuel suppliers have abstained from using MMT in non-reformulated gasoline.

4. Health Effects

Manganese is a nutrient that is necessary for the proper function of the human body. It helps to produce enzymes like hexokinase, superoxide dismutase and xanthine oxidase for processing blood sugars into energy and for preventing diseases like cancer and renal failure. But it also falls into a category of neurotoxic heavy metals like cadmium, lead and mercury. The body must have manganese to function properly, but must regulate concentrations carefully [ICCT, 2009].

The body absorbs manganese in food, and it has developed a way for taking only as much as it needs. When food makes its way from the digestive system to the circulatory system, it passes through the liver, which is well adapted to filter out high levels of manganese. It does this so well that instances of poisoning are rare in healthy individuals, although children may still be at risk (Wasserman et al., 2006). Individuals who are sick with liver disease or malnutrition cannot perform this function properly, so excessively high amounts of manganese in food and water can poison them.

The human body is less able to protect itself against manganese that travels through the air. When it enters the body, it penetrates deep into the lungs where it transfers into the bloodstream, bypassing the liver and making its way unfiltered to the brain. When airborne manganese passes through the nose, neurological pathways can transport it directly to the brain. These mechanisms explain why airborne manganese is much more dangerous than food borne. Manganese is safe only when filtered through a healthy digestive system, not when inhaled through the air.

There are a lot of related health effects studies available [ICCT, 2009]. In their study, which was reviewed by HEI⁸ [HEI, 2004], Yokel et al. [Yokel & Crossgrove, 2004] have provided convincing evidence that manganese enters the brain via carrier-mediated transport, confirming and extending previous observations. They also are the first to have shown that manganese leaves the brain via diffusion only, a much slower process than carrier-mediated transport. The finding that manganese transport out of the brain occurs via the slow process of diffusion, rather than via carrier-mediated transport, is important: It suggests that no mechanism exists to protect the brain from accumulating manganese. This finding has important implications for neurotoxicity resulting from chronic manganese exposure and accumulation.

HEI received a white paper from the Ethyl Corporation in response to Dr. Yokel's report. In their white paper, Dr. Taylor and colleagues take issue with the interpretation that manganese efflux may not occur via active transport, and offer alternative interpretations of the results. After carefully reviewing their arguments, the HEI Review Committee stated that while Dr. Taylor and colleagues had brought forward alternative explanations on mechanisms of manganese efflux, the Review Committee considered its original, caveated conclusion that Dr. Yokel's findings support a possible mechanistic explanation for accumulated manganese in the brain both appropriate and supported by the full range of current scientific evidence [HEI, 2005].

the effect thereof on vehicle emissions, fuel economy, performance, or for other related research objectives.

⁸ HEI is a non-profit corporation chartered in 1980 as an independent research organization to provide high-quality, impartial, and relevant science on the health effects of air pollution. Typically, HEI receives half of its core funds from the US Environmental Protection Agency and half from the worldwide motor vehicle industry. Other public and private organizations periodically support special projects or certain research programs. See also www.healtheffects.org

Two renowned organisations have taken a position on the use of manganese fuel additives. First, the American Academy of Pediatrics (AAP⁹) in its 2003 practice guidelines to paediatricians on environmental health entitled "*Paediatric Environmental Health*" makes recommendations on MMT [AAP, 2003]. The guidelines state that "*to permit addition of MMT to the US gasoline supply would not be prudent*" and recommend that, "*Prevention of exposure to the most toxic additives to gasoline, such as ... MMT ..., is best achieved by government regulation or phasing out of these compounds*".

Second, in June 2006 the International Commission on Occupational Health convened a workshop at the University of Brescia entitled "*Neurotoxic Metals: Lead, Mercury and Manganese – From Research to Prevention (NTOXMET)*". The conference participants, including researchers and physicians from 27 countries, adopted a consensus declaration on the prevention of the neurotoxicity of mercury, lead and manganese [Landrigan et al., 2006]. The declaration made the following statement: "*The addition of organic manganese compounds to gasoline should be halted immediately in all nations. The data presented at the Brescia Workshop raise grave concerns about the likelihood that addition of manganese to gasoline could cause widespread developmental toxicity similar to that caused by the worldwide addition of tetraalkyl lead to gasoline. In light of this information, it would be extremely unwise to add manganese to gasoline.*"

Furthermore, results of a recent study by Johnson-Matthey Plc. and the University of Minnesota [Gidney, 2009] indicate an increase of solid nanoparticle from engines which are operated with MMT containing fuel. There is an extensive discussion that ultrafine particles can cause adverse health effects¹⁰.

5. Vehicle and Emissions Impacts

5.1. Technical evidence

In response to concerns regarding the environmental impacts of pollutants emitted by gasoline-powered vehicles, the European Union has implemented extensive regulatory programs intended to reduce emissions of these pollutants. The significantly more stringent emission standards Euro 3 & 4¹¹ and now Euro 5 & 6¹² require new vehicle technologies that must comply with these standards in customer service for periods of 160,000 kilometres or more and must be equipped with on-board diagnostic (OBD) systems that alert operators to the presence of defects or malfunctions that increase emissions beyond certain regulated thresholds throughout the life of the vehicle.

The technology advancements that allow for compliance with new emission legislations include the incorporation of high-density close-coupled (HDCC) catalysts, which differ from earlier catalysts in that there are more catalyst cells per unit area. This increase in cell

⁹ The AAP was founded in 1930 to establish an independent forum for paediatricians to respond to the special developmental and health needs of children. The organization based in the United States today has 60,000 members.

¹⁰ The discussion on possible health effects caused by particles is well documented by the paper on the website of the Health Effect Institute (HEI): www.healtheffects.org

¹¹ DIRECTIVE 98/69/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 13 October 1998 relating to measures to be taken against air pollution by emissions from motor vehicles and amending Council Directive 70/220/EEC.

¹² REGULATION (EC) No 715/2007 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 20 June 2007 on type approval of motor vehicles with respect to emissions from light passenger and commercial vehicles (Euro 5 and Euro 6) and on access to vehicle repair and maintenance information in combination with COMMISSION REGULATION (EC) No 692/2008 of 18 July 2008 implementing and amending Regulation (EC) No 715/2007 of the European Parliament and of the Council on type-approval of motor vehicles with respect to emissions from light passenger and commercial vehicles (Euro 5 and Euro 6) and on access to vehicle repair and maintenance information

density significantly increases the active surface area of the catalyst while reducing the mass of the catalyst and therefore the time required to achieve the operating temperature of the catalyst. In addition, catalyst formulations have been modified so that they can routinely withstand temperatures in excess of 800°C for extended periods of time. These advancements have provided vehicle manufacturers with catalysts that can be placed closer to the engine and this allows the catalyst to reach optimum operating temperature quickly after the engine is cold-started in order to achieve very low pollutant emissions during all modes of operation.

In order to achieve compliance with current emission standards, the properties and composition of the fuel upon which a vehicle operates must be treated as an integral component of the vehicle emission control system during the design, testing, and routine operation of that system. Vehicle manufacturers treat the engine, aftertreatment system and fuel as a complete and inter-related system.

The worldwide automotive industry released a worldwide fuel charter [WWFC, 2006] that sets standards to harmonize global fuel quality [ACEA, 2006]. This charter recognises that for 'category one' fuels¹³, metallic (i.e. potassium-based) additives are needed for valve-seat protection in vehicles that are not equipped with exhaust catalysts. However, the WWFC strongly recommends the removal of metallic fuel additives to non-detectable levels for fuel used in catalyst equipped vehicles. The WWFC particularly refers to Fe, Mn and Pb.

During the late 1990s, new vehicles with advanced emission control systems began to be introduced in North America and Europe.

Studies performed by the auto industry have consistently found that the use of MMT in gasoline led to vehicle problems that included increases in engine-out hydrocarbon (HC) emissions, sparkplug misfire, exhaust valve leakage, varying degrees of catalyst plugging, increases in tailpipe emissions and/or exceedances of applicable emission standards. The auto industry studies also indicate that vehicles designed with the most sophisticated emission control systems are most susceptible to being adversely affected by the use of gasoline containing MMT [Sierra, 2008].

The studies conducted by Afton have purported to demonstrate either that the use of MMT in gasoline was benign, or that it improved catalyst performance to some degree and/or reduced certain emissions. However, recent studies by Afton as well as some Ethyl studies dating back to the 1970s have demonstrated that MMT can lead to catalyst plugging¹⁴ [Sierra, 2008].

Consequently, some vehicle manufacturers have expressly instructed vehicle owners not to use fuels containing MMT:

¹³ Category 1 fuels are for markets with no or first level of emissions control; based primarily on fundamental vehicle/engine performance and protection of emission control systems, e.g. markets requiring US Tier 0 or Euro 1 emission standards.

¹⁴ This study [Roos, 2007] is of particular interest because it confirms MMT related plugging of catalytic converter faces under laboratory conditions and postulates that plugging on in-use vehicles is not observed because of the action of poorly characterized particle "detachment" processes. An obvious conclusion that can be drawn from the Afton study is that MMT use in gasoline will lead to catalyst plugging on in-use vehicles whenever Afton's postulated particle "detachment" process is insufficient to clear the accumulated deposits of manganese oxides.

- In a 2004 user manual, Ford Motor Company says *"Your engine was not designed to use fuel or fuel additives with metallic compounds, including manganese-based additives.... Repairs to correct the effects of using a fuel for which your vehicle was not designed may not be covered by your warranty"* [Ford, 2004].
- Honda's owner's handbook contains this statement: *"Do not use gasoline containing MMT... this additive contaminates your engine components and exhaust emission control system, and can lead to a significant increase in emissions and a loss in performance and fuel economy. Damage caused by the use of fuels containing MMT may not be covered under warranty"* [Honda, 2004].
- To prevent the use of fuels, that are labelled as containing metal additives in 2010, the Volkswagen group will start the introduction of a world wide warning into all owner's handbooks: *"Fuels that are labelled at the pump as containing metals must not be used. LRP-fuels (Lead Replacement Petrol) also contain metallic additives in high concentrations. Danger of engine damage!"*

These statements/recommendations are based on technical evidence from testing under well defined conditions and from field experience.

5.2. Volkswagen

The presence of MMT has a negative effect on the durability and functionality of emissions relevant components. These findings are based on experience of experiments on test benches but also from the operation of vehicles in the field, from countries around the world where MMT is used in gasoline, e.g. South Africa and China as well as parts of Eastern Europe and Asia and Argentina.

Exhaust gas emissions limits are becoming much stricter and today a durability of at least 160,000 km (Europe, USA) has to be guaranteed. Consequently the catalytic surface and cell density (cells per square inch - cpsi) of the catalytic converters will increase from 300 cpsi for Euro 3 to 800 cpsi for Euro 6 (see [figure 5.1](#)).

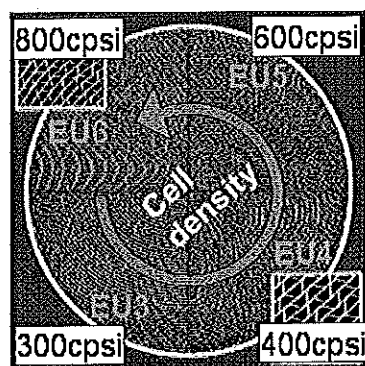


Figure 5.1: Relationship between cell density of catalytic converters and exhaust gas emission legislation

Plugging of catalysts due to manganese oxides is observed when MMT is added to the fuel as seen from catalysts operated in the Chinese market [Schindler, 2004], see also [figure 5.2](#).

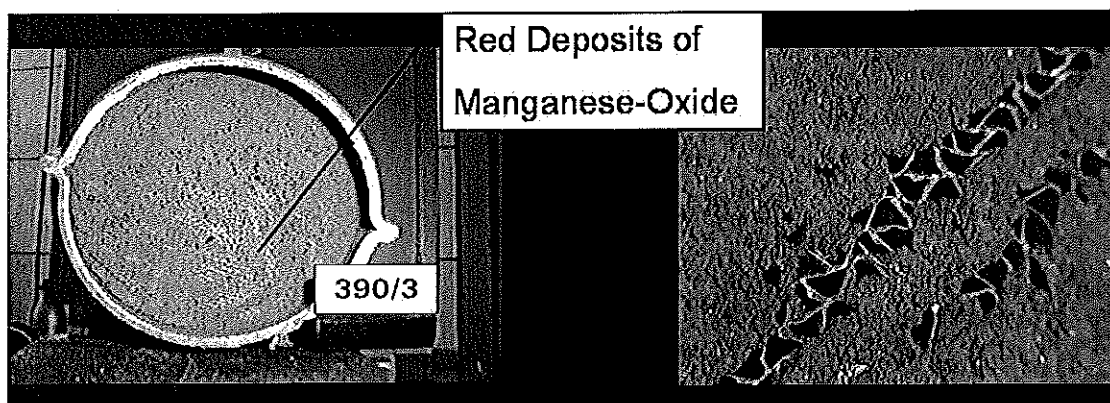


Figure 5.2: Deposits of manganese oxides on a catalytic converter operated in an vehicle from the Chinese market (front surface and detail)

With increasing cell density the blocking of the catalytic converter increases and the penetration depth of the manganese dioxide decreases (see [figure 5.3](#)).

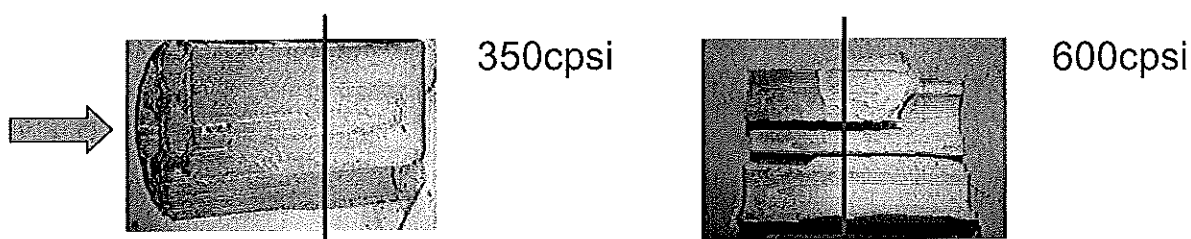


Figure 5.3: Penetration of manganese oxides in a catalytic converter depended on cell density

That Manganese (Mn) is the main constituent of the material plugging the catalytic converter is evident from spectral analysis as shown in [figure 5.4](#).

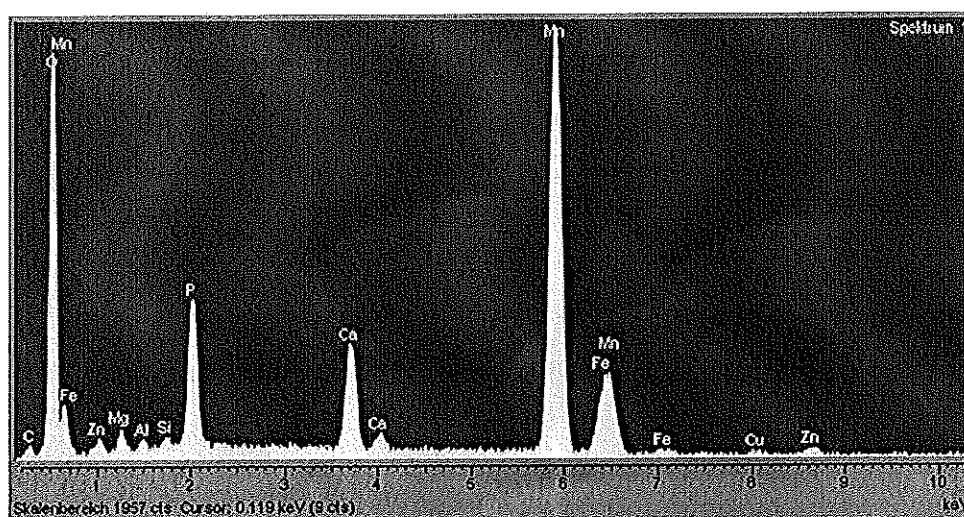
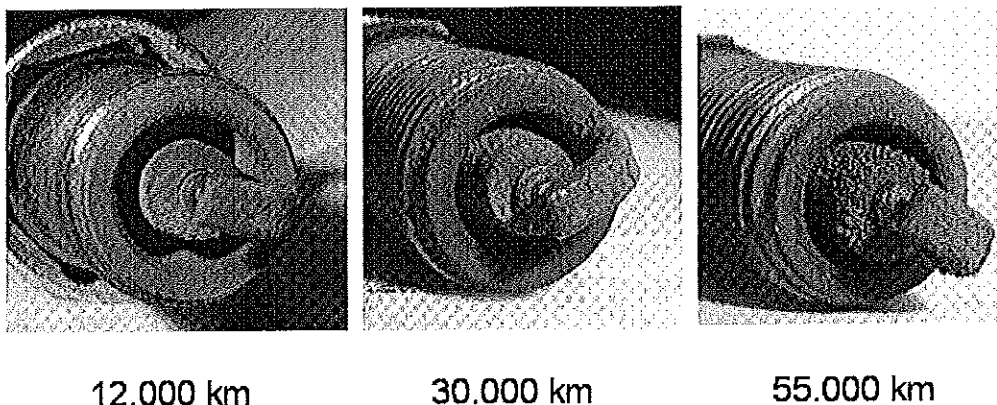


Figure 5.4: Spectrum of plugging material on a catalytic converter

Experience with MMT in fuels shows that manganese can cause other adverse effects than simply plugging the catalytic converter. Spark plug misfire or oxygen sensor biasing/malfunction, manganese containing deposits in the exhaust system (including

combustion chambers), deposits in piston ring grooves and wear on piston rings and ring grooves have all been observed (see [figure 5.5](#)).

Deposits on spark plugs:



Deposits on oxygen sensors:

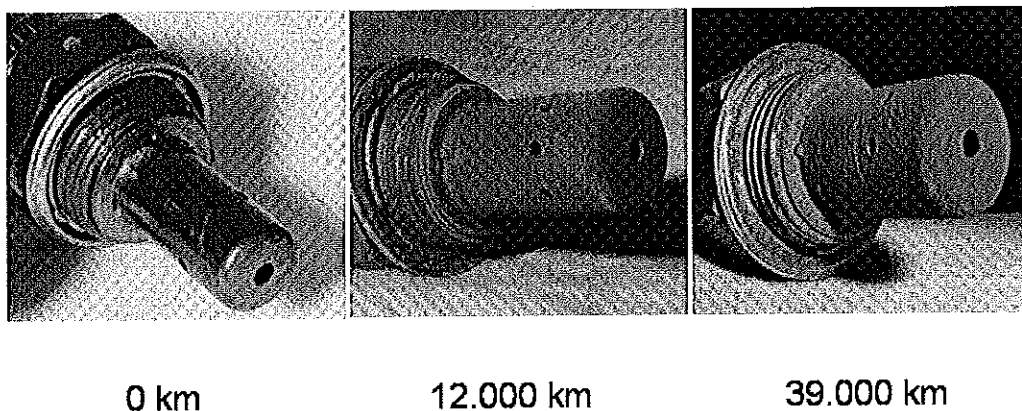


Figure 5.5: Manganese oxide deposits on spark plugs and oxygen sensors

The application of metallic additives (e.g. manganese) in European fuels would mean that compliance with the emissions standards of today and of the future can no longer be guaranteed for advanced catalytic converters and the emission control system.

Fundamentally, the stringent European emissions legislation demands the use of clean fuels. The presence of metallic additives in fuel contradicts this demand.

The use of fuels containing metals could invalidate customer warranties but vehicle manufacturers are faced with accepting goodwill claims to make any necessary repairs for something that is absolutely not their fault. Considerable repair costs can be anticipated at even modest vehicle mileages.

A manganese limit of 6mg Mn/l is harmful for current and future vehicles and it is a contradiction of the additive requirements¹⁵ of EN228.

Investigations have proved that the use of MMT in gasoline causes harmful effects.

¹⁵ In order to improve the performance quality, the use of additives is allowed. Suitable fuel additives **without known harmful side effects** are recommended in the appropriate amount, to help to avoid deterioration of drivability and emissions control durability. (EN 228 (July 2008), 5.3 Additive)

5.3. Ford

In [table 5.1](#) a summary of catalyst failures experienced by Ford gasoline vehicles in China is listed:

- One vehicle is from a customer, the remainder are Ford long-term test vehicles.
- There are inspection reports available for each failure and the table references each report with a unique 'C0xxxx' number [Ford, 2008].
- It is believed that fuel for test vehicles was bought from local suppliers and is the same as or similar to market fuel.
- On the dates when the failures occurred, China had significant amounts of manganese in the market ([see figure 5.6](#)).

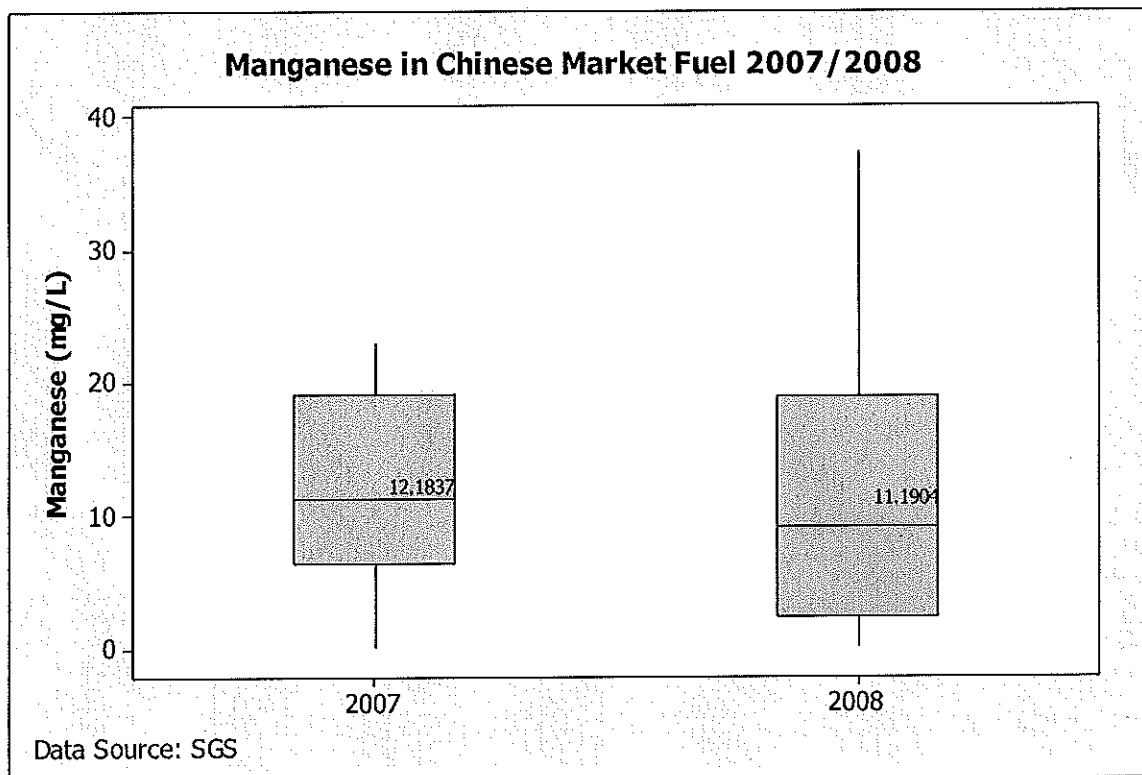


Figure 5.6: Manganese Levels in Chinese Market when Failures Occurred

Graph Information:

- Number on boxplot = mean of data
- Central line = median of data
- Grey box = median to 25%ile & median to 75%ile
- Lines = 0 to 25%ile & 75%ile to 100%ile

Table 5.1: Summary of catalyst failures from Ford vehicles operated in China

Report No.	Vehicle	Description	Date	Engine	Mileage (km)	Reported Problem
C08267	Ford Transit	Customer Vehicle	16/05/2008	2.3L I4	78,928	MIL light on/ Catalyst failure
C07044	Ford Focus	Ford catalyst aging vehicle	12/02/2007	1.8L I4	50,000	Loss of catalyst performance during emission test
C07523	Ford Focus	Ford catalyst aging vehicle	21/10/2007	2.0L I4	65,393	Catalyst inspection at end of catalyst aging drive cycle.
	Ford Mondeo	Ford catalyst aging vehicle	21/10/2007	2.0L I4	36,596	
C07228	Ford S-Max	Ford durability test vehicle	23/05/2007	2.3L I4	45,393	Loss of vehicle performance
C08039	Ford S-Max	Ford durability test vehicle	28/02/2008	2.0L I4	57,407	n/a

5.4. BMW

BMW recently examined the negative effect of MMT on passenger car catalysts. As an example, an analysed damaged catalyst showed that 90% of the catalyst frontal area was blocked and the manganese content of the deposit was approximately 75% (see [figure 5.7](#)).

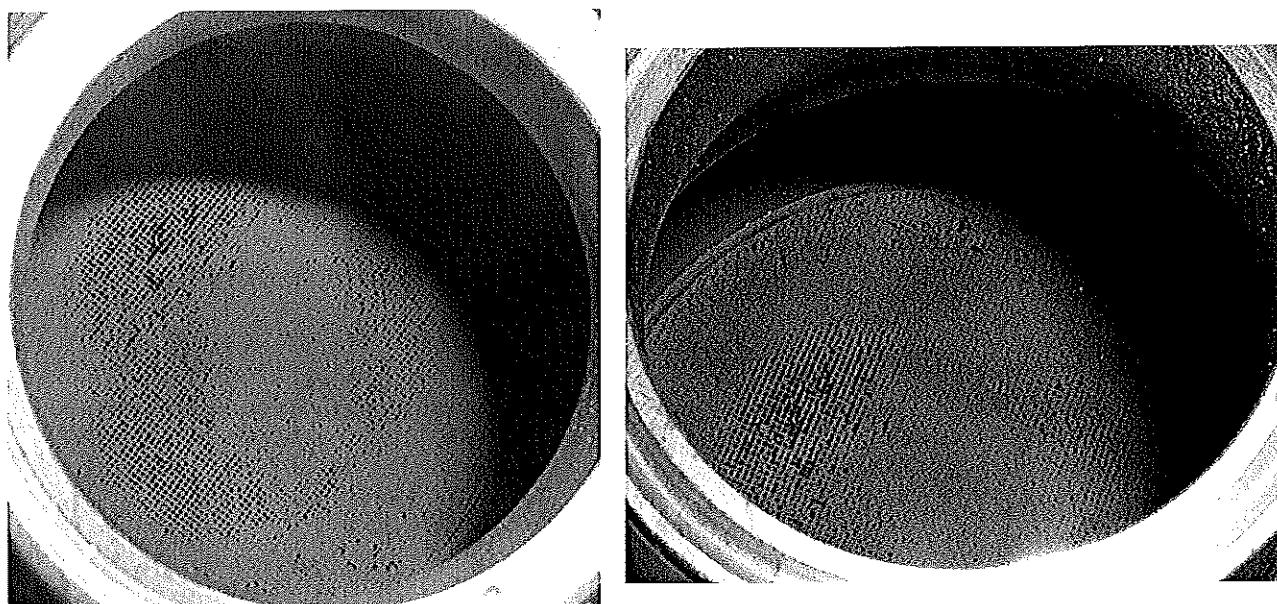


Figure 5.7: Catalyst frontal area: 90% blocked (manganese content of deposit: 75%)

Further examinations demonstrate the negative impact of MMT on the functionality such as the light-off and the catalytic conversion. The [figure 5.8](#) shows the comparison of

- the above mentioned catalyst exposed to MMT containing fuel (red line),
- a fresh catalyst (black line),
- and a comparably aged catalyst without manganese deposit (green line).

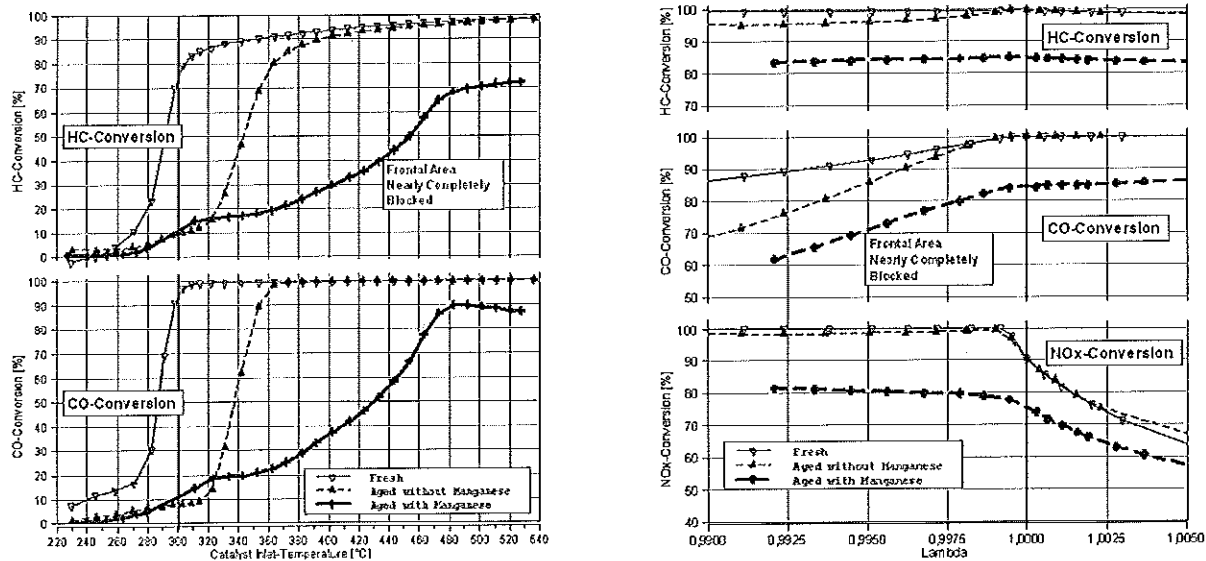


Figure 5.8: Light-off temperature and catalytic conversion of a catalyst almost completely blocked by manganese containing deposit (75% manganese)

5.5. German car manufacturers [Richter, 2007]

Researchers at Porsche performed a study of the impact of MMT on emissions and performance of the 2004 model-year Porsche Carrera, a vehicle with a horizontally opposed six cylinder engine certified to Euro 4 emission standards. The emission control system for this vehicle includes two 400 cpsi metal substrate catalysts in series for each of the two banks of cylinders. The test program involved engine dynamometer testing of two identical engine and emission controls systems sets. The engine dynamometer test cycle used was one hour in total duration and included operating conditions ranging from idle to near wide open throttle, with exhaust temperatures reaching a maximum of about 900°C. The 179 hours of operation on the engine dynamometer was reported to translate to about 60,000 km of on-road vehicle operation. In addition to engine dynamometer based tests, the engine's emission control system sets were placed into a test vehicle so that chassis dynamometer testing could be conducted.

The engines were operated on Super-Plus (EN228) and Super-Plus with MMT (15mg Mn/l). In comparison with the additive-free version, the engine using Super Plus with MMT yielded the following results:

— Power output and fuel consumption:

- 5% loss of engine power and 3% decrease of maximum torque;
- 6% higher exhaust-gas backpressure at nominal power and up to 5% higher specific fuel consumption.

- Exhaust emissions:
 - HC emissions in the EU test increased by 54%, exceeding the Euro 4 limit by 11% (increase of HC raw emissions by 30%);
 - NOx emissions in the EU test increased by 14%;
 - CO emissions remained similar on both fuels.
- Engine evaluation:
 - Manganese oxide deposits in the combustion chambers and exhaust system;
 - the strong manganese oxide deposits impair the operational reliability of the spark plugs;
 - catalyst function is clearly deteriorated by the manganese oxide deposits during both light-off and exhaust-gas conversion in the warmed-up condition;
 - the oxygen sensors were fully operable;
 - the engine wear patterns remained essentially the same.

According to the European standard for gasoline (EN228) it is permitted to use for the improvement of fuel quality only those additives which cause no harmful side effects¹³.

These investigations have proved that the use of MMT in gasoline causes harmful effects.

5.6. Experience from Canada [Sierra, 2008]

Given the fundamentally different conclusions reached by the auto industry and Afton, the Canadian Government considered conducting an independent or “third party” review of the effects of MMT. This review became moot, as a result of the voluntary phase-out of MMT use by Canadian refiners from 2003 to 2005. However, data collected in anticipation of the review, and while MMT was still in use in Canada, clearly demonstrate the adverse impacts of MMT on advanced technology vehicles. These data demonstrate that the use of MMT in Canadian gasoline adversely impacted at least 25 models of 1999 to 2003 model-year vehicles produced by nine manufacturers, which accounted for approximately 85% of Canadian light-duty vehicle sales in 2006. The means by which MMT adversely impacted these models includes severe catalyst plugging. Similar plugging was not identified on these models in virtually identical vehicle operating conditions in the United States, where MMT is not in widespread use.

Also, after MMT use was voluntarily halted by refiners, data shows that catalyst plugging cases in Canada quickly diminished. The data demonstrating the adverse impacts of MMT on exhaust emissions and advanced emission control technologies and systems on in-use Canadian vehicles were collected from the following sources:

In-use Canadian vehicles brought to dealerships by motorists for warranty service:

1. In-use Canadian vehicles recruited or obtained for data collection;
2. In-use parts from Canadian vehicles obtained by vehicle manufacturers;
3. Laboratory test programs performed in light of problems observed with in-use Canadian vehicles to confirm in-use findings and to investigate causative factors, and;
4. Vehicle emissions testing.

Because vehicles with advanced emissions control technologies were only beginning to be introduced into the vehicle fleet at the time MMT use was suspended in Canada, the ultimate impacts of MMT use on vehicle and emission system performance cannot be

definitively determined for two reasons. Firstly, some models introduced during the period when MMT was still in use in Canada may not have been sufficiently exposed to MMT before the voluntary phase-out for any adverse impacts to have developed. Secondly, because vehicles with advanced technologies were just beginning to be introduced as MMT was being removed, many advanced system designs that are now in-use were never exposed to MMT. Despite being only the "tip of the iceberg," what is known at this point about the consequences of the use of fuels containing MMT in vehicles that comply with the Tier 2 regulations is summarized as follows:

1. Plugging of catalysts due to manganese oxides on in-use vehicles can occur and has been documented at this point to be a substantial problem on a number of different models of in-use Canadian vehicles produced by a number of different manufacturers;
2. Vehicles with catalysts plugged by manganese oxides can have driveability problems due to excessive exhaust system backpressure. These problems can be corrected only by catalyst replacement;
3. Vehicles with catalysts plugged to a substantial degree by manganese oxides will generally experience MIL illumination and have fault codes stored indicating catalyst failure. The MIL can be extinguished and fault codes prevented from being stored only if the catalyst is replaced;
4. The plugging of catalysts by manganese oxides is most frequently observed on vehicles with advanced emissions controls systems that incorporate HDCC catalysts. Such vehicle designs are expected to become widespread as all new vehicles sold in the U.S. and Canada are required to comply with the requirements of the Tier 2/LEV II regulations;
5. Some advanced technology vehicles for which catalyst plugging due to MMT has been demonstrated have also been shown to have, to varying degrees, increased tailpipe emissions of volatile organic compounds (VOC), CO, and NOx;
6. The rates of Canadian catalyst warranty replacement where MMT related plugging has been documented were significantly higher than the U.S. warranty rate for vehicles equipped with the same emissions control systems. The rate of increase in Canadian warranty rates slowed in direct response to the reduction in the use of MMT in Canadian gasoline;
7. There is no demonstrated method, other than eliminating MMT from the fuel, to ensure that an emission control system that allows a vehicle to comply with the requirements of the Tier 2/LEV II regulations will not experience catalyst plugging caused by manganese oxides as well as one or more of the observed problems of degraded driveability, MIL illumination, and increased emissions.

In addition to being used to demonstrate the adverse impacts of MMT on vehicles, the data collected by the auto industry on advanced technology vehicles from the in-use laboratory of Canada have been combined with existing data and incorporated into the MOBILE6C¹⁶ emission factor model to evaluate the impact of MMT use on emissions from the Canadian vehicle fleet. This study reached the following conclusions:

1. Using conservative assumptions that likely understate the impact of MMT use on emissions of in-use vehicles, it was estimated that reintroduction of MMT in 2008 in

¹⁶ The MOBILE6 emission factor model enables the estimation of particulate matter and air toxics from the motor vehicle fleet with different oxygenate fuels, see U.S. EPA, 2002, User's Guide to MOBILE6.1 and MOBILE6.2: Mobile Source Emission Factor Model, DRAFT, EPA420-R-02-010, March 2002 and U.S. EPA, 2002, Technical Description of the Toxics Module for MOBILE6.2 and Guidance on Its Use for Emission Inventory Preparation, EPA 420 R 02 028, November 2002

Canada at historic levels would result in increases in VOC, CO, and NO_x emissions of 77%, 51%, and 12%, respectively, by 2020, and;

2. Despite the cessation of MMT use in Canada in 2004, the legacy of MMT use will cause increases in VOC and CO emissions, as well as modest reductions in NO_x emissions.

In summary, the recent Canadian in-use experience not only supports earlier auto industry study findings that demonstrated that MMT impairs the operation of emission control systems and increases emissions, but also provides significant evidence that the use of this additive is not compatible with the advanced HDCC catalyst systems that are needed to achieve compliance with stringent Tier 2 emission regulations.

5.7. Volkswagen field test in Argentina¹⁷

The aim of this field test was to determine with a vehicle test fleet in day-to-day Argentinean traffic whether Euro 4 and Euro 5 vehicles complying with the Euro 4 emission standards currently applied in Argentina can be correctly utilised up to a mileage of 100,000 km [Volkswagen, 2009]. Furthermore it was the aim to gain first experience with Euro 5 vehicles and determine whether the future Euro 5 emission legislation in Argentina can be complied with over longer mileages and with the fuels available in the market.

For the improvement of the octane number, especially at the filling stations of Petrobras and Esso, it was observed that these companies regularly use additives up to the maximum legally permitted limit observed. Petrobras and Esso supply approximately 30% of the Argentinean petrol demand. The remaining 70% are covered by Repsol YPF and Shell. Repsol YPF and Shell market petrol without manganese additives and have confirmed, on request, that their fuels are mostly free of such additives.

From specific fuel analyses at various filling stations it could be proven that the petrol sold by Petrobras and Esso contains an average of 10 to 15 mg Mn/l. The analyses of petrol from YPF and Shell (or their partners' stations) showed that their fuels were mostly free of manganese. Some deviations were explained by YPF with local field tests for the handling of metallic additives which will be finalised by 2010 and which will not be continued.

For the field test, three Seat Fabia (1,4L, MPI, 63kW and 1,6l, MPI, 77kW; Euro 4) and one VW Scirocco (1.4L, TSI 125kW, Euro 5) were used.

The test routes were chosen in a way that the operation of the vehicles mainly took place in the area of Argentina's main cities. Also the main route between Buenos Aires and Comodoro Rivadavia was used. Three vehicles (2 x Seat, 1 x VW) were fuelled exclusively at filling stations of Petrobras and Esso (Mn containing fuel) and one Seat vehicle was filled with petrol of YPF, Shell, Esso und Petrobras to get experience with mixed operation.

Intermediate result / actual status of the fleet (November 2009):

- Upon reaching (irrespective of the time period) 50,000 km, no exhaust gas tests were possible on all three Seat vehicles due to many driving defects and an extreme loss in performance. In all three Seat vehicles, plugged catalysts were diagnosed as being the reason for the driving defects;

¹⁷ Since the beginning of 2009, new vehicle types in Argentina may only be registered if they comply with Euro 4. Euro 5 will be introduced in Argentina from the beginning of 2012. Although in Argentina the introduction of the strict Euro 4 emission standards has started and the introduction of the even stricter Euro 5 standards is imminent, the addition of 18 mg Mn/l in gasoline is still permitted, according to the Argentinean regulations. Specific fuel analyses have shown a Mn content of 10 to 20 mg Mn/l.

- Two defective catalytic converters have been analysed already (see [figure 5.9](#)). In both cases the deposits consist of manganese oxide with a low share of phosphorus and calcium oxide. The manganese oxide share is > 90%;
- Related parts which are also relevant for the exhaust gas – exhaust gas sensor, spark plugs and fuel injectors – have not yet been analysed.
- The fourth vehicle (VW Scirocco 1.4 TSI) has shown similar (however, not as distinctive) driving defects at approx. 50,000 km. However, emissions testing indicate that the certified emission limits are exceeded by 200 to 400% (depending on the regulated pollutant), see also [table 5.2](#). Since this vehicle is still drivable, the test is being continued.

Table 5.2: Emission test results of the Argentinean field test (VW Scirocco Euro5 vehicle)

Overvlw emission test for ART-Otto							Results			Limit values Euro3			Limit values Euro4			
durability vehicle			fuel	test date	odometrie [km]	Place	fuel brand	THC	CO	NOX	THC	CO	NOX	THC	CO	NOX
Fzg	Int. Nr.	VIN						[g/km]	[g/km]	[g/km]	0,20	2,30	0,15	0,10	1,00	0,08
VW Scirocco 1,4i-118kW MKB: CAV TSI-DQ EU5	VW364-0-0004	wwwZZ13ZAV040444	Certification fuel	2009-08-05	181	AR	Patron	0,026	0,148	0,023	13%	6%	15%	26%	15%	29%
				2009-08-06	199	AR		0,027	0,145	0,024	14%	6%	16%	27%	15%	30%
			commercially available fuel with MMT	2009-08-11	307	AR	Petrobras	0,031	0,131	0,023	16%	6%	15%	31%	13%	29%
				2009-08-12	324	AR		0,034	0,126	0,025	17%	5%	17%	34%	13%	31%
				2009-10-28	52102	AR	Petrobras	0,211	2,038	0,338	106%	89%	225%	211%	204%	423%
				2009-10-29	52121	AR		0,23	2,018	0,379	115%	88%	253%	230%	202%	474%
			Certification fuel	2009-11-03	52366	AR	Patron	0,257	2,023	0,312	129%	88%	208%	257%	202%	390%
				2009-11-05	52404	AR		0,223	1,951	0,314	112%	85%	209%	223%	195%	393%

Legende:
ok
borderline
failed

Hinweise:
Patron = EURO-Norm (Referenz-Krst.)

Since approximately 70% of the Argentinean fuel market is covered by Repsol YPF and Shell, in two Seat vehicles the catalytic converters and all exhaust gas related parts were exchanged and the tests with manganese-free fuels from these manufacturers were continued up to a mileage of 100,000 km (these tests are ongoing).

These results, which are compatible with worldwide experience, show that the use of fuel additives containing manganese is harmful. As noted above, the tests on the VW Scirocco will continue up to the point where the driving defects become too serious to continue.

As a consequence of the worldwide experience with fuels containing metallic additives, especially considering the clear results of the Argentinean fleet, warning statements will be

included worldwide in the owner manuals of all vehicles produced by the Volkswagen group of companies.

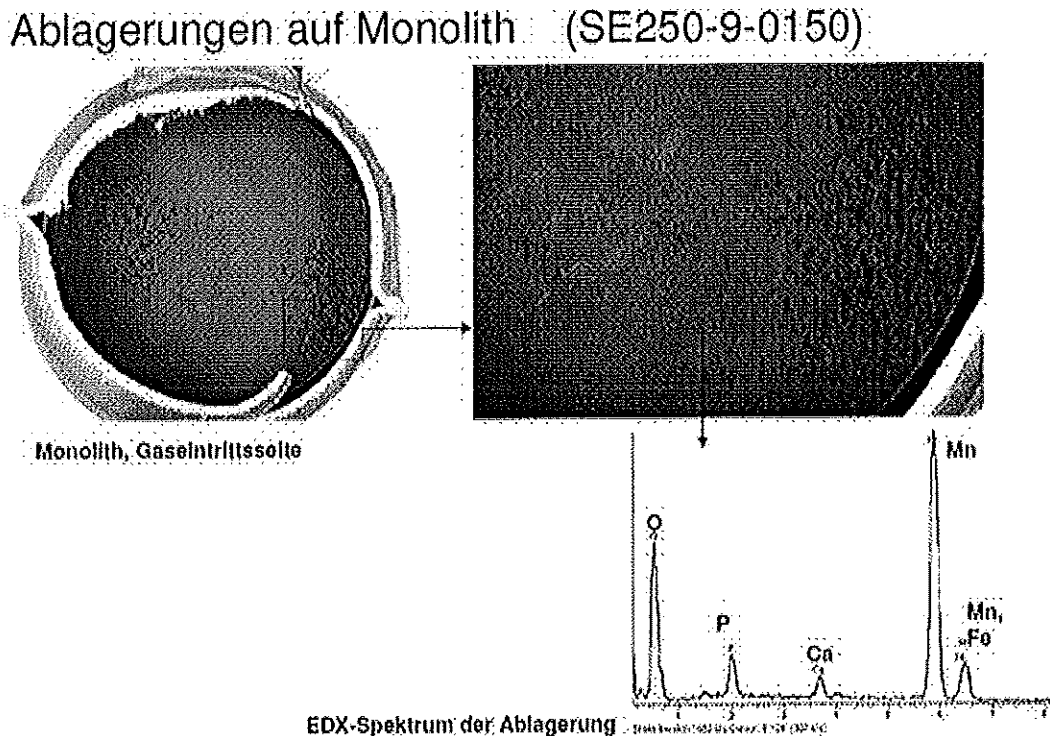


Figure 5.9: Deposits on the entrance of catalytic converters from the Argentinean field test (identified as predominantly manganese oxides by spectroscopy)

5.8. Review of Afton's latest SAE paper proposal

In a 2009 draft SAE paper (draft SAE 09SFL-0257¹⁸) Afton presented results of a fleet test of Honda and Ford vehicles up to 62,000 miles fuelled with petrol from regular local stations with and without MMT (8.3 mg Mn/l and 18 mg Mn/l). The draft paper was reviewed by 6 experts and was finally rejected by SAE.

Summary of Afton statements:

Fuels with MMT (up to 18mg Mn/l) are compatible with effective operation (62,000 miles) of vehicles equipped with Tier 2 (BIN5) emission control systems (catalysts with 600 up to 900cpsi) in severe real-world use.

Excerpt of reviewers conclusions:

- It has not been proved that it is possible to meet the emission standards of Tier 2 BIN 5 with fuel dosed with manganese since the fleet test regarding the ageing of the catalysts and mileage accumulation does not meet the relevant legal requirements;
- An ageing effect on the catalysts (and hence emissions) with fuels containing no MMT has not been found in this fleet test over the mileage of 62,000 miles. However, significant variations of the emissions were found in the Ford Explorer with 900 cpsi when using fuel with MMT;

¹⁸ Evaluation of the compatibility of the MMT® fuel additive in US Tier 2 vehicles. Moffatt et al.

- The Afton fleet test does not show the “severe real-world” behaviour of the customer in the field. Consequently a key parameter of the interaction of manganese and catalyst in the field, i.e. the temperature and, as a consequence, the influence of the emissions, is not reflected in this fleet test.

The ageing behaviour of manufacturers vehicles for the correct and full-useful life fulfilment of the U.S. Standards are issues on which the U.S. authorities take great care in certifying vehicles.

- It could not be proved, for example by chemical analyses, activity or desorption tests that manganese in the fuel does not lead to deposits in the catalyst or on other emission-relevant parts. Pictures of clean catalysts or exhaust system components at all are suspiciously missing from the Afton paper;
- Any proof that vehicles OBDII systems are not influenced by manganese in gasoline is completely missing and is only derived indirectly.

Conclusions:

A systematic scientific approach is missing in this field study which claims to evaluate the influence of metallic additives in fuels on modern exhaust emission control systems (emissions and OBD). Statements and conclusions are not comprehensible and are not well founded.

6. Precautionary arguments

The precautionary principle is broadly discussed in the ICCT paper [ICCT, 2009]. The precautionary principle means that when an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically. A precautionary measure is therefore an action to protect health and the environment when there is cause for concern before any harm has appeared. Precaution encourages a thorough pursuit of alternatives to the proposed action and places a burden of proof on the proponent of the action.

This principle has been adopted in legislation by the governments of Sweden and Germany; forms the basis for the National Environmental Policy Act in the U.S, which requires environmental reviews of new construction; and informs international agreements like the UN Treaty on Biodiversity.

Policy makers have a duty to act proactively to prevent harm rather than reactively when the harm occurs.

The precautionary principle was not applied to lead, and this failure yielded significant public health costs. As early as 1924, public health scientists including Yendell Henderson of Yale University stated that widespread use of tetraethyl lead constituted a “*probable industrial and public health hazard*” [D. L. Davis, 2002]. Despite this awareness and the lack of scientific certainty on the matter, no restrictions were placed on tetraethyl lead. The cumulative mental health effects of lead exposure would have been avoided with the precautionary principle.

In the 1970s, the US Court of Appeals applied the precautionary principle to a regulation on lead phase-out. It found that the EPA does not have to prove that a product is a public health hazard in order to prohibit its use. It merely should show that the product is likely to be dangerous. This finding allowed the phase-out and the eventual ban on leaded gasoline.

Today, risk assessments are the tool that many governments and scientific bodies use to assess the potential harm of new chemicals, new technologies and a variety of other

vectors with unknown effects on human health and the environment. They have been useful in evaluating worker exposures and setting air quality standards. But risk assessments can only rely on available information and quantifiable risks. The first risk assessment for lead, for example, produced a safety standard that has since been revised multiple times in response to new research and a clearer understanding of its effects. Risk assessments are an essential tool for policymaking, but they are limited by the peer reviewed scientific research available. Risk assessments are not replacing precaution.

Scientific certainty is a high standard. The process of research coupled with the vetting, reviewing and consensus-building necessary to achieve it requires large amounts of time. But policy makers do not have the luxury of time to wait for a decision about the safety of a particular action or environmental exposure. In the case of MMT, what should the policy maker do in the absence of certainty?

The precautionary principle provides guidance. In the case of MMT, it advocates restrictions to protect human health and the environment. Where the health of large numbers of people is at stake and the harm is potentially irreversible, it is far better to err on the side of caution than wait for scientific certainty. Therefore the precautionary principle advocates the type of action that is protective against harm.

The precautionary principle provides additional guidance. When an environmental exposure poses a threat, it suggests consideration of alternatives. In the case of MMT, this means consideration of alternative mechanisms to boost octane. The use of the precautionary principle is made easier in the case of MMT, where a range of effective alternatives are available to boost octane to the necessary levels, e.g. blending petrol with ethanol or ethers.

Finally, the precautionary principle advises that the proponent of a potential harm, in this case the Afton Chemical Corporation, bear the burden of allaying the concerns about the health effects and other impacts of its product, MMT.

Research on vehicle emissions impacts provides compelling evidence that use of MMT over the life of the cleanest vehicles will result in an increase in pollutant emissions, reduced fuel economy, and greater stress on vehicle components and pollution control systems (see section 5 above). Research on ambient exposures to manganese shows that such exposure can produce accumulation of manganese in the brain (see section 4 above). Taken together with what is already known about manganese neurotoxicity, this research offers a persuasive reminder of the potential for widespread harm. It does not make sense to experiment with the introduction of a potential human neurotoxin until and unless such concerns are definitively laid to rest.

7. Conclusions

The use of metallic additives like manganese-based MMT and lead-based Tetraethyl Lead present similar situations. Each is a major concern to the automotive industry due to metallic deposits that shorten the lifetime of engine components and harm catalysts and other elements of a vehicle's emission control system that are necessary to meet emissions regulations.

The health impacts are likewise worrisome. The low cost of metallic additives does not reflect the high cost of health impacts nor the cost of repair and replacement of vehicle components that deteriorate when exposed to these additives through their use in fuel.

For all these reasons it makes sense to apply the precautionary principle in setting regulations to restrict the use of metallic additives in gasoline. It took decades for the world to understand and counter the lethal effects of lead and, by that time, a lot of damage had been done. With MMT there is still a chance to avoid a repeat of this historical mistake.

Countries can avoid using manganese-based fuel additives like MMT in gasoline. Many cost-effective alternatives for boosting octane exist and each country and region can determine which alternative works best for them. This simple action will help national governments to secure air quality improvements and enable emission reductions that fully protect public health and the environment.

8. References

AAP (2003). Gasoline and its additives. In R. A. Etzel & S. J. Balk (Eds.), *Pediatric Environmental Health* (2nd ed.): American Academy of Pediatrics Committee on Environmental Health.

Davis, D. L. (2002). *When Smoke Ran Like Water: Tales of Environmental Deception and the Battle Against Pollution*. New York, NY: Basic Books.

Ford 2004 MY Regular Fuel Recommendation. Included in letter to the Detroit advisory panel - API October 2003.

Ford (2008). Ford Characterisation Reports.

Gidney J. T. et al (March 2009). Effect of Organometallic Fuel Additives on Nanoparticle Emissions from a Gasoline Passenger Car. Cambridge (UK) Particle Meeting, 16 March 2009

HEI (2004). Synopsis of Research Report 119. Manganese Transport at the Blood–Brain Barrier

HEI (2005). Response by the Health Effects Institute's Health Review Committee (January 3, 2005) on a White Paper by Michael D. Taylor, Gerard D. Pfeifer, and Jerry M. Roper, Ethyl Corporation (Manganese Toxicokinetics at the Blood-Brain Barrier: Manganese Efflux)

Honda (2004). Maintenance FAQs. Retrieved Sep 1, 2004, from www.ahm-ownerlink.com/Maintenance/maint_faqs.asp

ICCT (September 2004). Status Report Concerning the Use of MMT in Gasoline.

ICCT (January 2009). Methylcyclopentadienyl Manganese Tricarbonyl (MMT): A science and policy review.

Landrigan, P., Nordberg, M., Lucchini, R., Nordberg, G., Grandjean, P., Iregren, A., et al. (2006). The Declaration of Brescia on Prevention of Neurotoxicity of Metals. *American Journal of Industrial Medicine*, 50(10), 709-711.

Richter, H. et al. (2007). "Influence of Ash-Forming Gasoline Additives Such as MMT on Exhaust Emissions and Performance Characteristics of PC-Engines". *Erdöl Erdgas Kohle* 123 (5).

Roos, J.W., et al, "The Interaction of MMT Combustion Products with the Exhaust Catalyst Face," Society of Automotive Engineers Technical Paper Series, Paper No. 2007-01-1078, 2007

Schindler, K. P. (2004). "Impact of MMT on vehicle emission performance". Presentation to the Asian Vehicle Emission Control Conference (AVECC). Beijing, China.

Sierra Research Report No. SR2008-08-01: Impacts of MMT® Use in Unleaded Gasoline on Engines, Emission Control Systems, and Emissions (29 Aug 2008)

Volkswagen (2009). Report concerning the use of MMT in gasoline from a field test in Argentina. In preparation.

WWFC (September 2006). Worldwide Fuel Charter, Fourth Edition (first established in 1998). The Alliance of Automobile Manufacturers (AAM), the Engine Manufacturers Association (EMA), the Japan Automobile Manufacturers Association (JAMA), and the European Automobile Manufacturers Association (ACEA) Association of International Automobile Manufacturers (AIAM) with following Associate members: Association of International Automotive Manufacturers of Canada (AIAMC), Asociacion Mexicana de la Industria Automotriz, A.C. (AMIA), Brazilian Association of motor vehicle and motorised agricultural machinery manufacturers (ANFAVEA), Canadian Vehicle Manufacturers' Association (CVMA), Chamber of Automotive Manufacturers of the Philippines, Inc. (CAMPI), China Association of Automobile Manufacturers (CAAM), Indonesia Automotive Federation (IAF), Korean Automobile Manufacturers Association (KAMA), National Association of Automobile Manufacturers of South Africa (NAAMSA), Malaysian Automotive Association (MAA), Thai Automotive Industry Association (TAIA), and Vietnam Automobile Manufacturers Association (VAMA).

Yokel, R. A., & Crossgrove, J. S. (2004). Manganese toxic kinetics at the blood-brain barrier. Health Effects Institute. Report 119.

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Update: MMT

Thu, 2012-10-02 Ray Minjares

We've had requests for a September 2010 update on the situation regarding the fuel additive MMT that was inadvertently vaporized in the course of a website overhaul in late 2011. Text of the 2010 update appears below, supplemented by additional and more recent info on developments in China.

Background

Manganese is a neurotoxin and heavy metal. The combustion of MMT in gasoline releases manganese phosphates, manganese sulfates, and manganese oxides into the air. When inhaled, these compounds may enter the bloodstream through the lungs and deliver dangerous doses of manganese to the brain, where accumulation can lead to Parkinsons-like symptoms including loss of motor control, memory loss, erratic behavior, and brain cell death. A recent study carried out in Mexico City found that exposure to both manganese and lead in early childhood led to exacerbated neurodevelopmental deficiencies and that the impacts of coexposure were more severe than expected based on exposure to each metal alone. There is no known treatment or cure.

The ICCT's work in this area is summarized [here](#) and [here](#).

A rare consensus exists among automakers, refiners, and the public health community in favor of restricting the use of manganese compounds in fuels. But regulation remains uneven, in part because of vigorous efforts by the manufacturer of MMT, Afton Chemical, to promote its use and contest proposed restrictions. This continues a pattern set by Afton's predecessor the Ethyl Corporation, which for decades avoided restrictions on tetraethyl lead and manganese-based additives.

Public health professionals agree about the threat and the remedy. In 2003 the American Academy of Pediatrics recommended phasing out MMT from gasoline. The 2007 Brescia Declaration on Prevention of Neurotoxicity of Metals called for an immediate halt to the addition of organic manganese compounds to gasoline.

Automakers also want to eliminate MMT in fuels, for the very different reason that it damages emissions control components. To maintain emission and engine performance, BMW, General Motors, Honda, and Toyota and others have jointly defined standards for unleaded gasoline that explicitly exclude metallic additives, including MMT.

In 2009 the European Union adopted amendments to its fuel quality directive that set an interim limit on MMT in fuel of 6 mg of manganese per liter, falling to 2 mg/L in 2014, and also required labeling of fuel containing metallic additives. That put Europe in line with trends elsewhere, especially in the developed countries. The U.S. prohibits manganese entirely from reformulated gasoline, which constitutes more than 60 percent of the U.S. fuel supply, and California bans manganese entirely. Oil refiners voluntarily exclude manganese additives from the remainder of the U.S. supply, as well as from the fuel supply in Canada, the European Union, Japan, India, and Indonesia. The extent to which MMT is used in fuels elsewhere is impossible to determine with confidence, as Afton does not make public the list of countries where it is sold.

China gasoline fuel standard (2011)

On May 12, 2011, the Standardization Administration of China adopted the China IV standard for motor vehicle gasoline (GB17930-2011). This gasoline fuel quality standard will be implemented nationwide on January 1, 2014. Two points worth noting with regard to the fuel additive methylcyclopentadienyl manganese tricarbonyl (MMT):

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- The standard recommends a limit of 2 mg/liter of MMT for China V gasoline—the same limit set for the European Union in 2014 in the 2009 amendments to the Fuel Quality Directive.
- The 2 mg/liter MMT limit for motor gasoline is also the same as that specified in the Hazardous Materials Control Standards for Motor Vehicle Gasoline (IV, V) adopted by the China Ministry of Environmental Protection (MEP) on Feb 14, 2011 (GWKB 1.1-2011). While the Hazardous Materials Control Standard is a voluntary standard, it serves as the reference fuel specification for city and provincial governments intending to adopt more stringent vehicle emissions and fuel standards ahead of the national schedule and before the China V standard is adopted nationally.
- Beijing proposes to adopt the China V gasoline standard, with a limit of 2 mg/liter of MMT, for implementation in 2012.

Reference standards lowered in Canada (2008) and California (2010)

In December 2008, the State of California Office of Environmental Health Hazard Assessment (OEHHA) lowered its reference exposure level (REL) for chronic inhalation of airborne manganese to 0.09 µg/m³ from 0.2 µg/m³, and set an REL for 8-hour exposure at a maximum level of 0.17 µg/m³. California also added manganese to its list of toxic air contaminants that may cause infants and children to be especially susceptible to illness. This requires that actions to control emissions of manganese must be adequate to protect the health of infants and children.

In June 2010, Health Canada lowered its reference concentration for airborne manganese—the concentration to which the general population and sensitive subgroups can be exposed for a lifetime without appreciable harm—to 0.05 µg/m³ in PM_{3.5}. This is significantly lower than the previous standard of 0.11 µg/m³, which had been in place since 1994. The Canadian reference standard is now at a level on par with the US EPA reference standard.

Health-based limits on exposure to pollutants are an important complement to fuel regulations. In 1996 (a period when Canadian gasoline contained MMT), a Toronto study found that 10% of adults there were exposed to concentrations of ambient manganese greater than Health Canada's new reference concentration of 0.05 µg/m³ in PM₁₀.

EU limits withstand legal challenge (2009)

In 2009 the European Parliament adopted amendments to its Fuel Quality Directive that ordered an assessment of health and environmental risks from metallic additives in fuel (Directive 2009/30/EC). The results of that assessment, to be based on a test methodology developed specifically for the purpose, are to be delivered at the end of 2012. In the meantime, the directive limited the presence of MMT in fuel to 6 mg of manganese per liter in 2011, and 2mg/L in 2014. Those limits are to be revised based on the results of the required risk assessment, and could fall to zero. The directive further required that fuel containing metallic additives be labeled as such whenever it is made available to consumers.

Afton Chemical immediately sued on several grounds, the most important of which were that the directive improperly applied the precautionary principle and failed to comply with the principle of proportionality—i.e., that it exceeded the limits of what is appropriate and necessary to achieve a legitimate objective. In July, the High Court of Justice of England and Wales ruled against Afton Chemical, stating in part: "Where it proves to be impossible to determine with certainty the existence or extent of [an] alleged risk because of the insufficiency, inconclusiveness or imprecision of the results of studies conducted, but the likelihood of real harm to public health persists should the risk materialise, the precautionary principle justifies the adoption of restrictive measures. . . . In those circumstances, it must be acknowledged that the European Union legislature may, under the precautionary principle, take protective measures without having to wait for the reality and the seriousness of those risks to be fully demonstrated."

The High Court's judgment concisely summarizes the logic that the ICCT has consistently argued should govern regulation of MMT. As restrictions grow tighter in North America and Europe, industry will look elsewhere for markets, and policy makers should use their discretion to control the dangerous and unnecessary use of metallic fuel additives. As the Clean Air Initiative for Asia (CAI-ASIA) argues, "the environmentally responsible approach for Asian countries is to apply the precautionary principle for these metallic additives [MMT and ferrocene] and to not use them until and unless the scientific and health studies show that they are safe."

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Main proceedings

Judgment of the Court (Fourth Chamber) of 8 July 2010.
Afton Chemical Limited v Secretary of State for Transport.
 Reference for a preliminary ruling: High Court of Justice (England & Wales),
 Queen's Bench Division (Administrative Court) - United Kingdom.
 Reference for a preliminary ruling - Validity - Directive 2009/30/EC - Article 1(8) -
 Directive 98/70/EC - Article 8a - Atmospheric pollution - Fuels - Use of metallic
 additives in fuels - Limit for methylcyclopentadienyl manganese tricarbonyl (MMT)
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 Case C-343/09.

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The Nevada Petroleum Marketers Association has indicated that the proposed manganese labeling requirement may be in direct conflict with federal law:

Specifically, Section 211(c)(4) of the Clean Air Act expressly provides that "no State (or political subdivision thereof) may prescribe or attempt to enforce, for purposes of motor vehicle emission control, any control or prohibition respecting any characteristic or component of a fuel or fuel additive in a motor vehicle or motor vehicle engine – (i) if [EPA] has found that no control or prohibition of the characteristic or component of a fuel or fuel additive under paragraph [§ 211(c)(1)] is necessary and *has published his finding in the Federal Register*, or (ii) if the [EPA] has prescribed under paragraph (1) a control or prohibition applicable to such characteristic or component of fuel or fuel additive, *unless State prohibition or control is identical to the prohibition or control prescribed by the [EPA]*." See 42 U.S.C. § 7545(c)(4)(A) (emphasis added).